230

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 7 IN SET 208

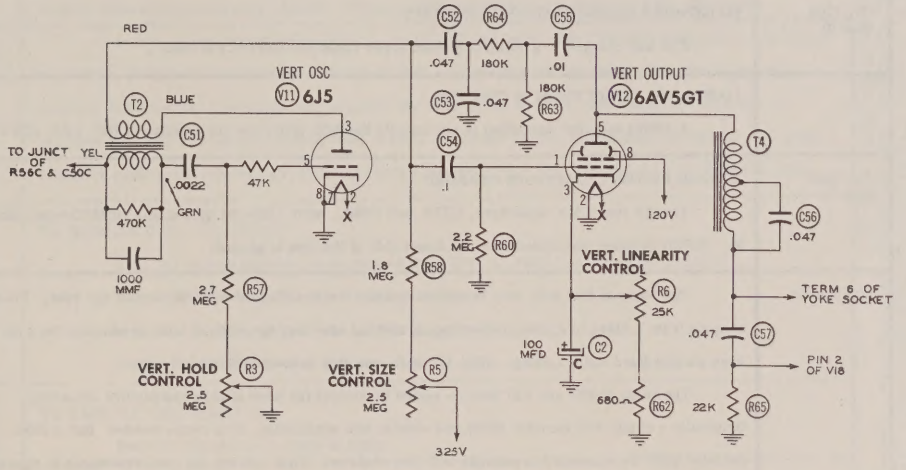
Ch. 17B8

Muntz Models 2763A, 2764A and 2765A (Ch. 17B8, Serial No. 374500 and up) are covered in Photofact Folder 7, Set 208. Models 324T2 and 327T1 have now been added. These models are electrically identical to the ones covered except, a 24QP4 picture tube is used in Model 324T2.

In later production of Ch. 17B8 the following changes were made. These changes are identified by the run number stamped on the chassis. Original production used no run number and Run 1 was not used.

Ch. 17B8 (No Run

The vertical oscillator and vertical output circuit were revised. A partial schematic of the revised circuit is given below.



TO MEET UL REQUIREMENTS

The 5 Amp., 250V., fuse in the primary of the power transformer, T1, was omitted. The .5 Amp., 250V., fuse, which is shown as M1 in Set 208-7 was added to the chassis.

TO ALLOW VARIOUS BRANDS OF 6CD6 TUBES TO BE USED

C71 was changed from .01MFD to .022MFD.

R73 was changed from 100KΩ to 82KΩ.

R77 was changed from 82KΩ to 68KΩ.

These changes are shown in Photofact Folder 7, Set 208.

ANTI-PIN CUSHION MAGNETS DELETED

The anti-pin cushion magnets, M6, were omitted.

TO ELIMINATE VERTICAL PULSE IN AUDIO

A metal shield (part #MP-0487) was placed between the vertical output tube, V12, and the audio output tube, V9, to eliminate buzz in the audio, caused by radiation from V12 to V9.

MUNTZ MODELS 324T2, 327T2, 2763A, 2764A, 2765A (Ch. 17B8)

PRODUCTION CHANGES
BULLETIN 87

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Ch. 17B8 (Run 2)	VERTICAL CIRCUITS RELOCATED The vertical oscillator and vertical output tubes (V11 and V12) and their associated components were moved to a point in front of the power transformer (T1) on the chassis. This change was made to reduce radiation from the vertical circuits into the audio output stage. The circuit remains the same except for the new physical location.
Ch.17B8 (Run 3)	FUSE CHANGED The .5 Amp. fuse, M1, was deleted from the plate of V15 and screen of V14 and a 5 Amp. fuse was added in the primary side of the power transformer (T1).
Ch. 17B8 (Run 4)	TO REDUCE THE EFFECT OF THE CONTRAST CONTROL ON THE SOUND A 270MMF capacitor was added from the cathode (pin 2) of the video amp. (V6) to ground. In addition, capacitors C1B and C2A were interchanged. This reduces the coupling effect between the two sections of the capacitors.
Ch. 17B8 (Run 6)	TO IMPROVE HORIZONTAL AFC STABILITY C66 was changed to a .01MFD molded paper capacitor (part #CPM-0101) .
	TO ISOLATE TUNER FROM IF CIRCUITS A 4700Ω resistor was added in series with the AGC lead from the junction of R19, R20, C23 to C6.
Ch. 17B8 (Run 7)	AC LINE FILTER CAPACITORS CHANGED The AC line filter capacitors, C73A and C73B, were replaced by 2 single .01MFD capacitors and an 820KΩ resistor was added from the fused side of the line to ground.
All Chassis	The value of R60 may vary in earlier chassis due to differences in the scan of the yoke. Values ranging from 1.2Meg to 2.2Meg depending on vertical size may be used. In later production the yoke has been standardized and a 1.8Meg, ±10%, 1/2 watt, resistor is used in this application. The value of R86 and R87 may be varied to correct for neck shadow and picture centering. Originally a single 27Ω resistor (R86) was used in this application. It is recommended that a 120Ω resistor (R87) be connected in parallel with this resistor. This reduces the total resistance to approximately 22Ω, however, other values may be used depending on the shadow and centering problem. NOTE: The connections for terminals 6 and 8 of T3 are reversed in Photofact Folder 7, Set 208. Terminal 6 should go to the junction of R86 and R87 and terminal 8 should go to the plate cap of V16.

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 14 IN SET 189

Ch.17T1, 21T1

Raytheon Models C-1735A, C-1736A (Ch. 17T1), C-2108A, C-2110A, C-2111A (Ch. 21T1), M-1733A (Ch. 17T1) and M-2107A (Ch. 21T1) were covered in Photofact Folder 14, Set 189. Models M-17336A, M-1733iA, M-1733mA (Ch. 17T1), M-2107bA, M-2107iA and M-2107mA (Ch. 21T1) have now been added to this group. Later production changes and chassis additions are given below.

Ch.17T2, 21T2

Models C-2109A (Ch. 21T2), M-1734A, UC-1735A, UC-1736A (Ch. 17T2), UC-2109A, UC-2110A (Ch. 21T2), UH-1734bA, UM-1734iA, UM-1734mA (Ch. 17T2), UM-2107bA, UM-2107iA, and UM-2107mA (Ch. 21T2) are identical to the Models covered except a built-in UHF tuner is included. For service information on this this tuner refer to Model UHF-100, Set 207-8.

Ch.17T4, 17T5 21T5, 21T6

Models C-1739A, C-1741A (Ch. 17T4), C-2127A, C-2129A (Ch. 21T5), M-1737iA, M-1737mA (Ch. 17T4), M-2125iA, M-2125mA (Ch. 12T5), UC-1740A, UC-1742A (Ch. 17T5), UC-2128A, UC-2130A (Ch. 21T6), UM-1738iA, UM-1738mA (Ch. 17T5), UM-2126iA and UM-2126mA (Ch. 21T6) have also been added. These models are identical to the models covered except a planetary drive tuning arrangement is used instead of the dial cord chassis. Chassis 17T5 and 21T6 also contain the UHF-100 tuner.

Ch. 17T1, 17T2, 17T4, 17T5, 21T1, 21T2, 21T5, 21T6,

In later production of these chassis several changes were made. These changes are given below. Production Changes in Raytheon television receivers are coded by placing the RETMA date code, in reverse, following the chassis number stamp on the rear of the chassis. For example, 21T1-523 represents 325, which is the twenty-fifth week of 1953. This code number is changed only when a production change is made in the chassis and all receivers are coded with that number until the next change is made.

Code 432

TO IMPROVE SYNC STABILITY

R62, V11 screen resistor, was changed from 27KΩ to 22KΩ and connected to 235V.

R71 and R72 were replaced by one 100KΩ resistor.

A single .01MFD capacitor was used in place of C76 and C77.

A single 100MMF capacitor was used at C90.

Code 932

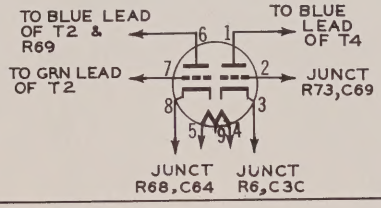
TO IMPROVE VERTICAL SYNC

R64 was changed from 12KΩ to 33KΩ.

Code 542

TO INCREASE HEIGHT

The vertical oscillator and output tube, V12, was changed from a type 12SN7GT to a 12BH7. Pin connections for the 12BH7 are given below.



Yellow Splash on VHF Tuner

TO ELIMINATE CHANNEL 6 OSCILLATION

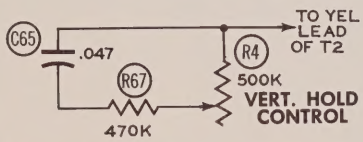
R19 was changed from 2200Ω to 100Ω.

L15 was replaced by a 2200Ω resistor.

No Code

TO INCREASE THE RANGE OF THE VERTICAL HOLD CONTROL

R67 was changed from 330KΩ to 470KΩ and connected as shown below.



TO DECREASE THE 1X2A FILAMENT VOLTAGE

R90 was changed from 2.2Ω to 3.9Ω.

TO IMPROVE HORIZONTAL LINEARITY

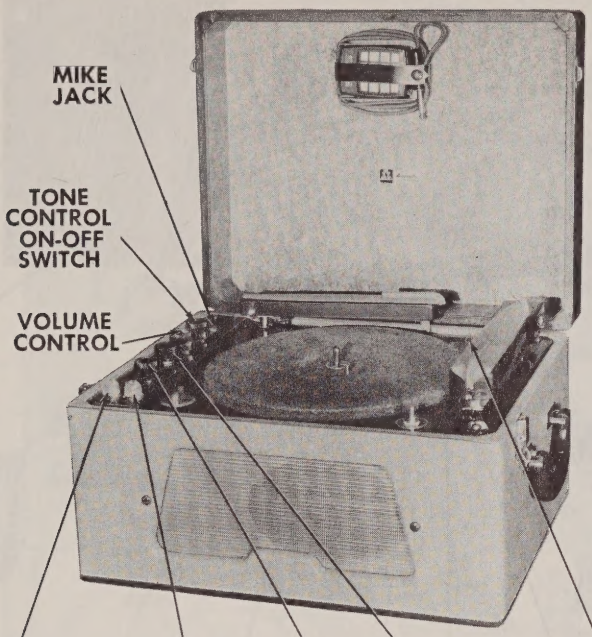
The anti-pin cushion magnet, used on 21" Models, was replaced by a horizontal linearity magnet (part #16M-21526).

TO INCREASE THE RANGE OF THE VERTICAL HOLD CONTROL WHEN THE 12BH7 TUBE IS USED

R67, which was changed to 470KΩ above, was increased to 560KΩ and connected as above.

Code 803	COMPONENT CHANGES DUE TO PROCUREMENT DIFFICULTIES The vertical oscillator and output tube was changed from a type 12BH7 to 12SN7GT. A 220KΩ resistor was added between the 235V source and the junction of C3, R70 and R71. The horizontal output transformer was changed to part #201-21025-1. All connections to this transformer remain the same.
"B" following Code No.	PROCUREMENT DIFFICULTIES C31, mixer bypass capacitor, was omitted.
"Q" following Code No.	PROCUREMENT DIFFIC ULTIES The RF amplifier (V1) was changed from a 6BK7 to a 6BQ7 tube.
Code 113	PROCUREMENT DIFFICULTIES The fusing resistor, R94, was omitted and a 7.5Ω , 5W resistor and a 1.6 Amp., 125V fuse connected in series, were added in its place.
Code 213	TO ELIMINATE SHADING ON THE LEFT SIDE OF PICTURE C90 was changed from 1000MMF to .01MFD.
Code 313	The fuse and resistor combination, added in Code 113 above, were omitted and the original 5.6Ω fusing resistor was reinstalled in its place.

AIRCASTLE
MODEL 603.880



AIRCASTLE
MODEL 603.880

TRADE NAME	Aircastle Model 603.880
SUPPLIER	Spiegel, Inc., 1061 W. 35th St., Chicago 9, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver with Disc Recorder & Playback Unit.
TUBES (Six)	Types 6BE6 Conv., 6BA6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6AV6 Mic Amp., 6X4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycle RATING .33 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator lug (antenna section) of tuning gang. Low side to chassis.	455KC (400%Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"
4.		"	600KC	Tune to 600KC signal	"		Check tracking. If necessary bend outer rotor plates of antenna section of tuning gang slightly for optimum tracking. Repeat step 3.

Replace chassis in cabinet, turn tuning gang fully closed and set pointer parallel with left hand edge of cabinet at low frequency end of dial.

FOR SERVICE INFORMATION ON RECORDER UNIT PART NO. 2305A - SEE SIMILAR GENERAL INSTRUMENT MODEL R90 - PHOTOFACT SET 35 - FOLDER 28 OR RECORD CHANGER MANUAL CM-1.

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PARTS LIST AND DESCRIPTIONS

AIRCASTLE MODEL 603.880

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	Converter	6BE6	6BE6	7CH	
V2	IF Amplifier	6BA6	6BA6	7BK	
V3	Det.-AVC-AF Amp	6AV6	6AV6	7BT	
V4	Audio Output	6AQ5	6AQ5	7BZ	
V5	Mic Amplifier	6AV6	6AV6	7BT	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	200	1001	AFH4-45		DO43		FP419.3	TVL-4470	
B	■40	150								
C	▲10	150								
D	20	25								
C2	.1	200	804	PR288-1	DF-104	MP-2P1				
C3A	220		♦		♦PC-151				♦103C5	
B	01									
C	250									
D										
E	.005									
C4	4700		906	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C5	2000		907	BPD-002	D6-202	TM5D2	801-002	DC-522	5HK-D2	
C6	4700		906	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C7	10000		819-B	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C8	10000		819-B	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	

♦ Items C3A, C3B, C3C, C3D, C3E, R8A, R8B, R8C are combined in one unit.
When replacing separately items C3C and C3D have to total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	1/2	401C	Q13-133	AG-60-Z	BSK-60-S	U-48	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	500KΩ	1/2	408A	Q13-133	AG-60-Z	BSK-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	NOTES
R3	22KΩ	1/4	517	BTS-22K	
R4	150Ω	1/2	505	BTS-150	
R5	2.2Meg	1/2	615	BTS-2.2Meg	
R6	47KΩ	1/2	523	BTS-47K	
R7	50Ω	1/2	520		
R8A	5 Meg	1/2	♦		
B	250KΩ	1/2			
C	500KΩ	1/2			
R9	2.2Meg	1/2	615	BTS-2.2Meg	
R10	330Ω	1	609	BTA-330	
R11	1 Meg	1/2	516	BTS-1Meg	

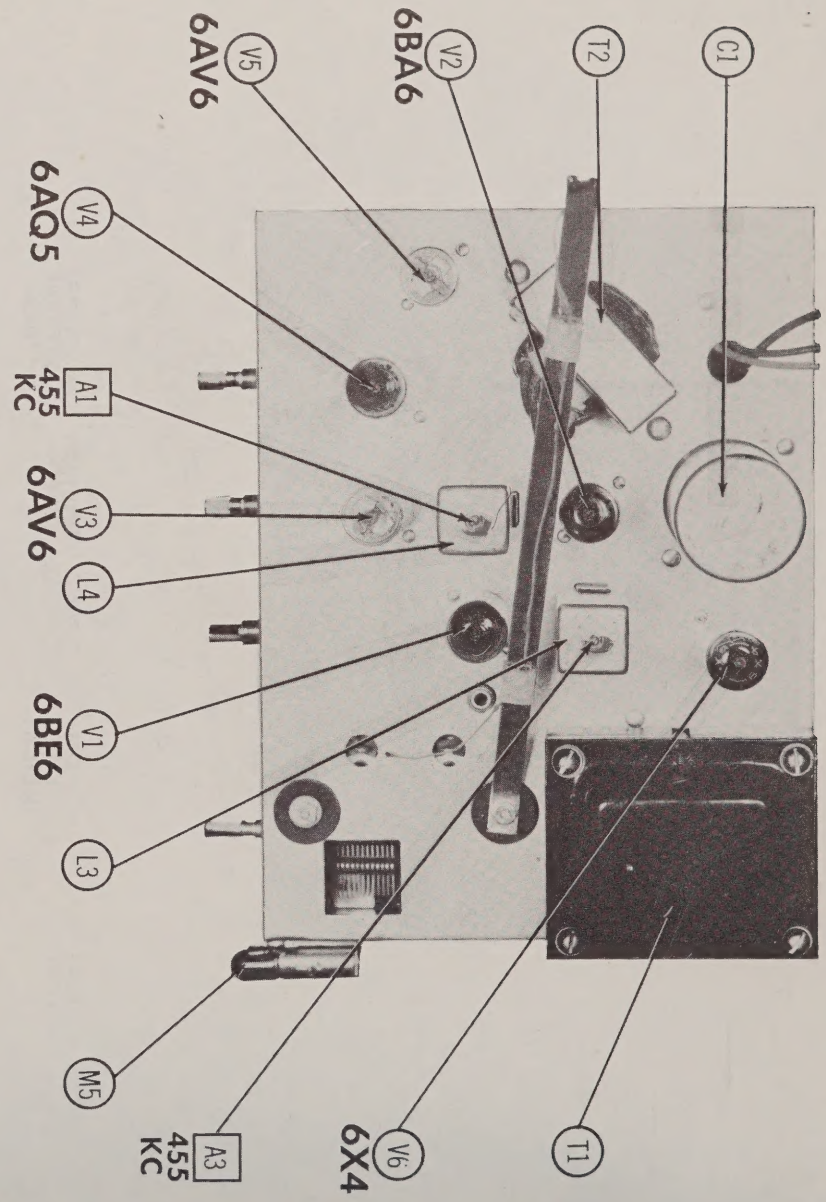
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	NOTES
R12	10KΩ	1/2	522	BTS-10K	
R13	510KΩ	1/2	502		
R14	10Ω	1/2	527		
R15	4.5Ω	1/2	526		
R16	5 Meg	1/2	525		
R17	100KΩ	1/2	507	BTS-100K	
R18	1000Ω	1	607	BTA-1000	
R19	2200Ω	1	616	BTA-2200	
R20	4.5Ω	1/2	526		Note
R21	10Ω	1/2	527		Note

Note: Not used in all models.
♦ Items R8A, R8B, R8C, C3A, C3B, C3C, C3D, C3E are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117V @ .33A	340VCT .045A	6.3VAC @ 2.34A		1103				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	4.6KΩ	3.5Ω	416Ω	15Ω SEC. 2 1.9KΩ	1202					

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRCASTLE PART No.	VIKING PART No.	QUAM PART No.	
SP1	4 x 6"	PM	3.5Ω	2610B	46J6	46A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	AIRCASTLE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.6Ω		1512-D				
L2	Osc. Coil	5.5Ω		1401			69-Osc.	Tapped @ .7Ω
L3	Input IF	13Ω	14Ω	1405	16-6758	BC-352	12-C1	
L4	Output IF	13Ω	14Ω	1406-A	16-6758	BC-353	12-C2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	AIRCASTLE PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	2534	AC-AG-J	A-AG	W26B	A66U	33	0-2 or S-2	* Crystal cutter
M2	12126	*X-26						

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

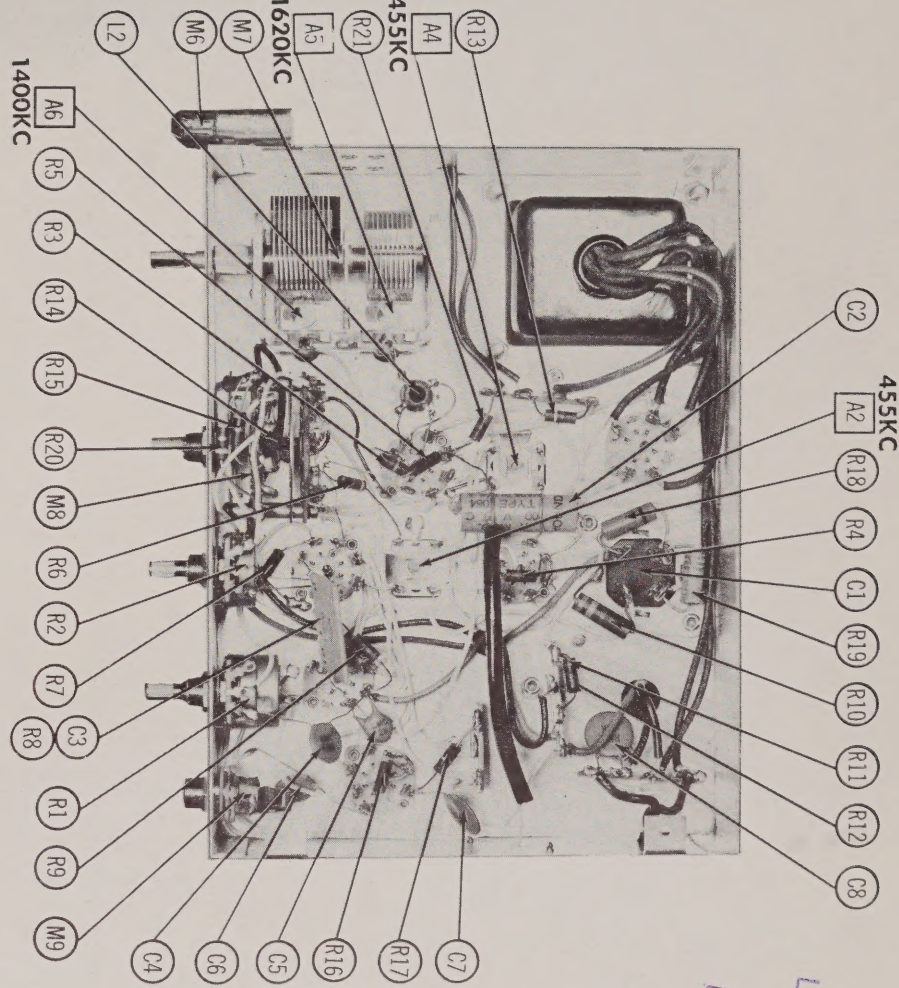
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	AIRCASTLE PART No.	WALCO PART No.	JENSEN PART No.	
M3	2541	W-20AGA or W-21AGS	E902 or E962	* Cutting needle
M4	*2514A	WC-25		

MISCELLANEOUS

ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M5	Level Indicator	2202-A	Type NE51
M6	Dial Light		Type #47
M7	Tuning Cap.	1011	28-410MMF, 23-200MMF
M8	Switch	2204	Function Selector
M9	Shorting Type Jack	1875	2 Used (Mic & Ext. Spkr.)
	Case	2107-A	
	Dial Plate	2801	
	Pointer	1736-B	
	Knob	2401-A	Tuning, Volume, Off/On/Tone (3 used)
	Knob	2401	Function Selector

CHASSIS—BOTTOM VIEW



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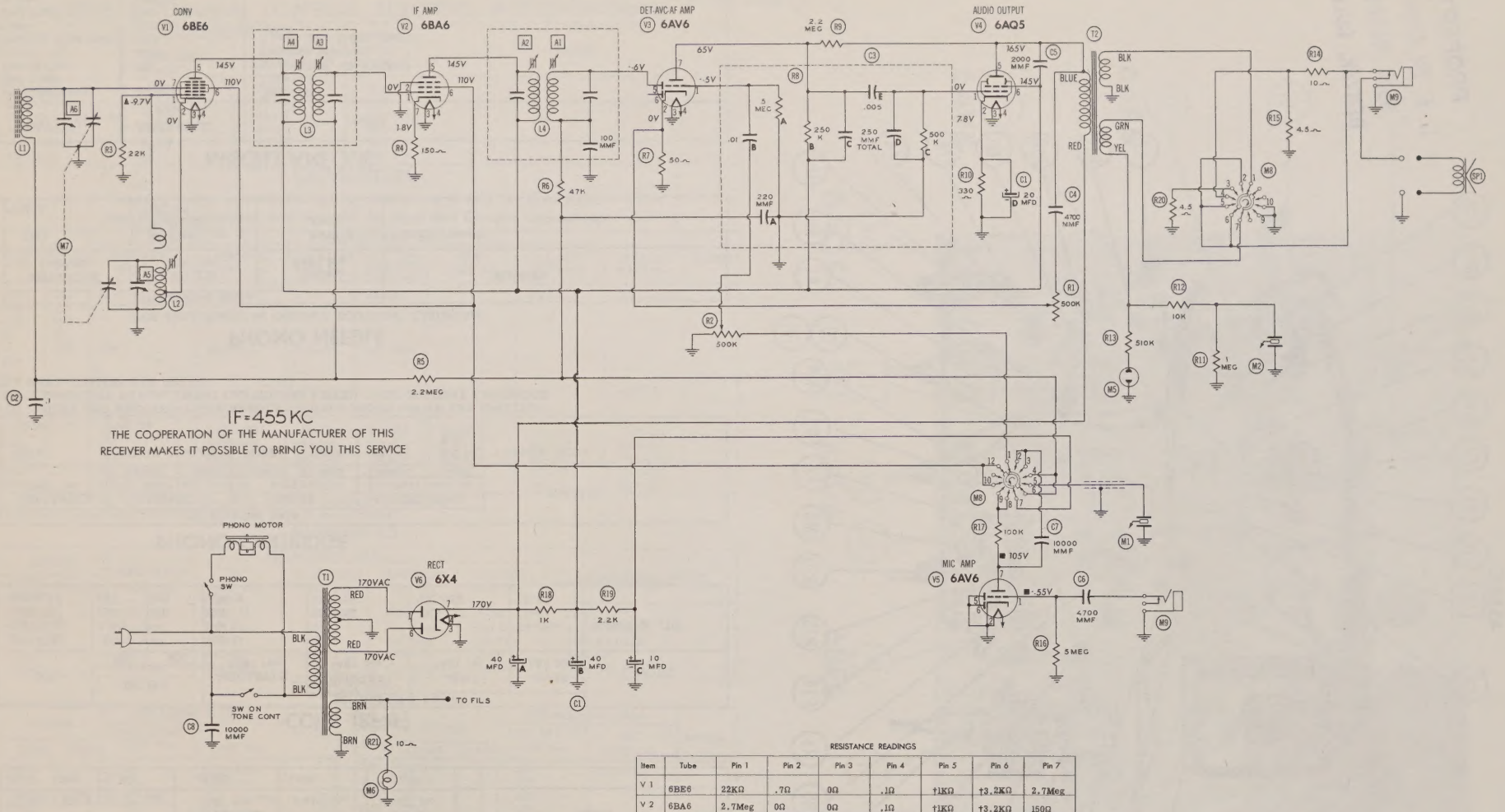
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

AIRCASTLE MODEL 603.880

AIRCASTLE MODEL 603.880



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BE6	22KΩ	.7Ω	0Ω	.1Ω	†1KΩ	†3.2KΩ	2.7Meg
V 2	6BA6	2.7Meg	0Ω	0Ω	.1Ω	†1KΩ	†3.2KΩ	150Ω
V 3	6AV6	5Meg	50Ω	0Ω	.1Ω	550KΩ	INF	†220KΩ
V 4	6AQ5	500KΩ	330Ω	0Ω	.1Ω	†416Ω	†1KΩ	500KΩ
V 5	6AV6	5Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	■†100KΩ
V 6	6X4	115Ω	INF	0Ω	.1Ω	INF	110Ω	900KΩ

ALL MEASUREMENTS TAKEN IN "RECORD RADIO" POSITION UNLESS OTHERWISE SPECIFIED
■ MEASURED IN "RECORD MIKE " POSITION
▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V6

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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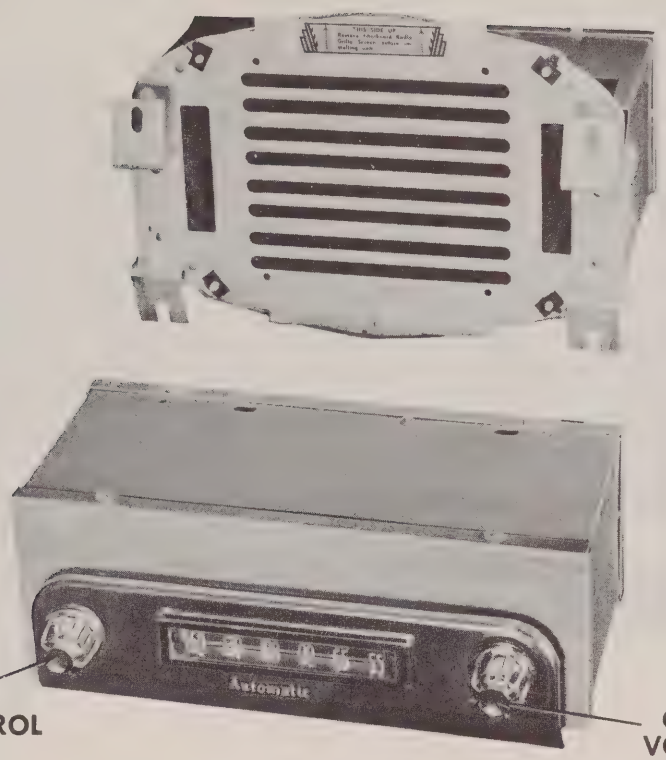
1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

PROPERTY OF
L. E. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



AUTOMATIC
MODEL CM-333

TRADE NAME	Automatic Model CM-333 (For 1953 Chevrolet Automobiles)
SUPPLIER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston, Mass.
TYPE SET	Battery Operated Custom-built Automobile Superheterodyne Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 (or) 6AV6 Det.-AVC-AF Amp., 6V6GT Audio Output, 6X5GT Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.3 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	538-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	68MMF	High side to antenna terminal. Low side to chassis.	1600KC	"	"	A5	"
3.	"	"	1400KC	Tune to 1400KC signal	"	A6, A7	"
4.	"	"	600KC	Tune to 600KC signal	"	A8, A9	"
5.	Repeat step 3.						

With tuning gang fully closed set pointer to left edge of "55" on the dial.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		AUTOMATIC PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4A	Det.-AVC-AF Amp.	6AT6	6AT6	7BT	
B	Det.-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Audio Output	6V6GT	6V6GT	7S	
V6	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AUTOMATIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	350	CE-86	AFH3-109		CO80		FP345.8	TVL-3678	
B	▲20	350								
C	20	25								
C2	.05	200	C503-2	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C3	.05	200	C503-2	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C4	.05	200	C503-2	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C5	100		CC101	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C6A	220									
B	5000									
C			*PC-151	*PA-113-2	*PC-151		*1408-02		*103C5	
D	5000									
E										
C7	.01	600	CC101	P688-01	DD-1032	PTE6S1	GP2-333-103	PT611	6TM-S1	
C8	.005	200	C502-6	P688-005	D6-502	PTE6D5		PT625	6TM-D5	
C9	.008	1600	C802-16	VBC-26		PTE16D8		PT1628	MB-D8	
C10	.5	100	CC504-1	VHC-36		MP2P5		RF480	2TM-P5	
C11	.5	100	CC504-1	VHC-36		MP2P5		RF480	2TM-P5	

* C6A, C6B, C6C, C6D, C6E and R8A, R8B, R8C are combined in one unit.
When replacing items separately C6E and C6C must total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AUTOMATIC PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	750KΩ	½	RV-57	Q13-137	AG-79-Z	B-70-S	U-51	Volume-Note
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

Note: Some Models may use an alternate control (part #RV-333)

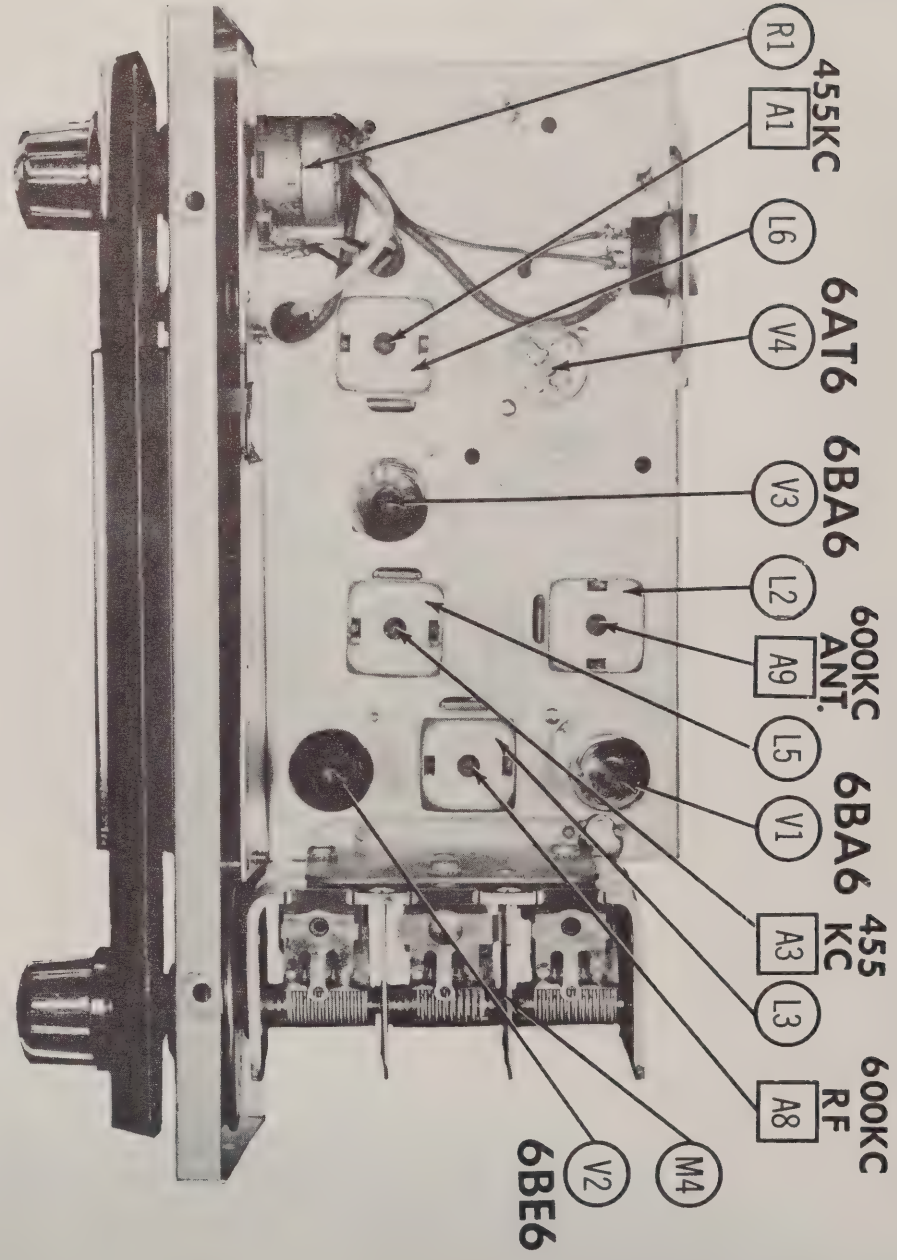
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AUTOMATIC PART No.	IRC PART No.	
R2	1.2Meg	½	R125	BTS-1.2Meg	
R3	330Ω	½	R331	BTS-330	
R4	22KΩ	½	R223	BTS-22K	
R5	1500Ω	½	R152	BTS-1500	
R6	22KΩ	2	R223-2	BTB-22K	
R7	2.2Meg	½	R225	BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AUTOMATIC PART No.	IRC PART No.	
R8A	6.8Meg	½		BTS-6.8Meg	
B	470KΩ	½	*PC-151	BTS-470K	
C	470KΩ	½		BTS-470K	
R9	470KΩ	½	R474	BTS-470K	
R10	330Ω	½	R331	BTS-330	
R11	1000Ω	1	R102-1	BTA-1000	
R12	100Ω	½	R101	BTS-100	Note
R13	100Ω	½	R101	BTS-100	Note

* Items R8A, R8B, R8C, C6A, C6B, C6C, C6D, C6E are combined in one unit.
Note 1. Some Models may use a 82Ω resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	AUTOMATIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VAC @2A	430VCT .046ADC			TV-100		P-2971	VT-1 ①	V-16K

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		AUTOMATIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	5KΩ	3.2Ω	370Ω	.54Ω	Part of Spkr.	A-3877	A-2930	RO-9 ①	S-3X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AUTOMATIC PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6 x 9"	PM	3.2Ω	PM-900	ST-810 Mod. P69-V	69A3	

COILS (RF-IF)

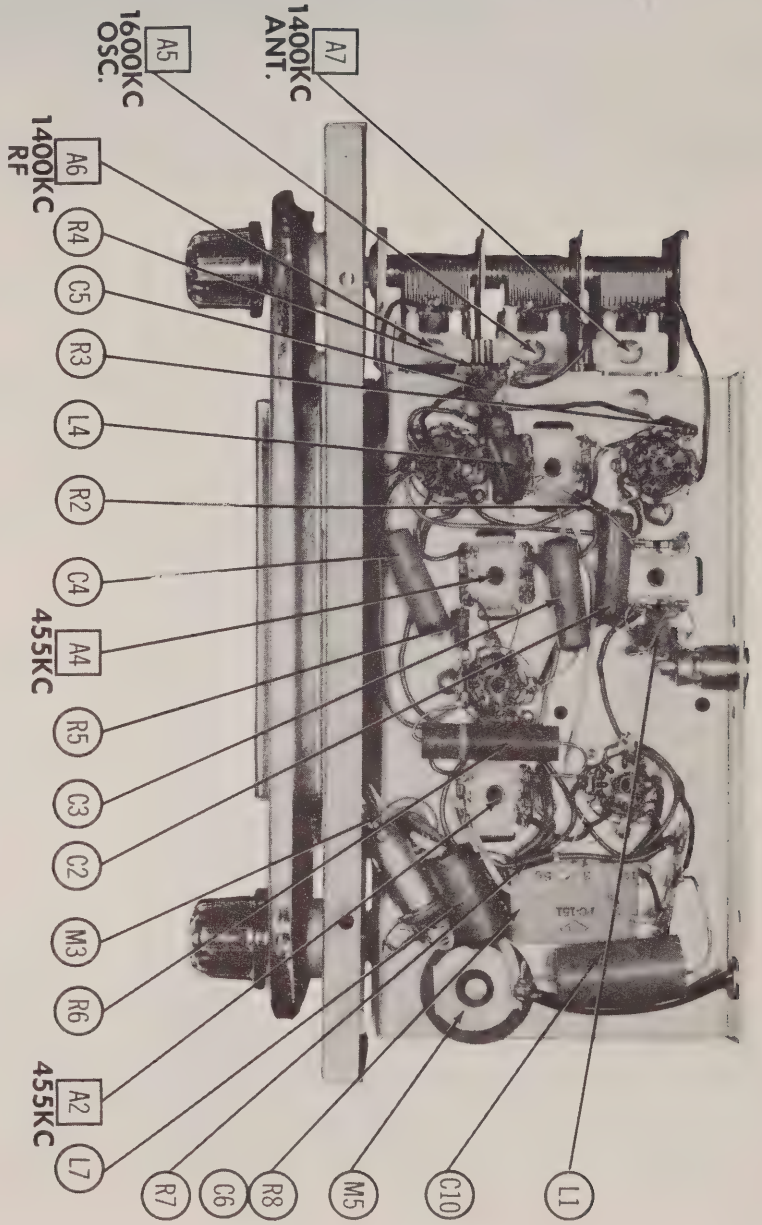
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	AUTOMATIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant.RF Choke	1.1Ω		L200			4624 *	14 Microhenries, wound on 10MMF capacitors.
L2	Ant. Coil	14Ω	4.6Ω	57FB-3				
L3	RF Coil	95Ω	6Ω	57FB-4				
L4	Osc.Coil	9Ω		L201			71-Osc.†	Tapped @ .7Ω
L5	Input IF	19Ω	19Ω	1655-16	16-6758	BC-352	12-C1	
L6	Output IF	19Ω	19Ω	1655-16	16-6758	BC-353	12-C2	
L7	Fil. Choke	0Ω		L203			5221	15 Microhenries
L8	Vibrator Hash Choke	0Ω		L202				21 Microhenries

* Connect in series with 10MMF Capacitor.
† Drill mounting hole.

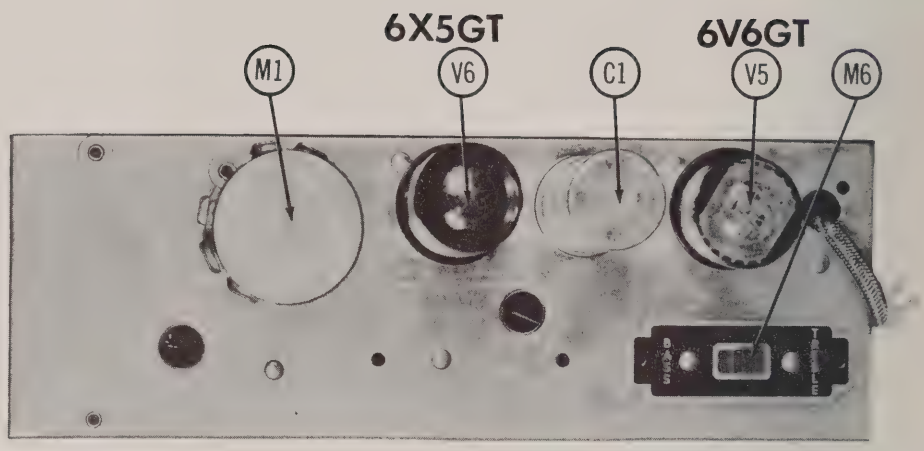
VIBRATOR

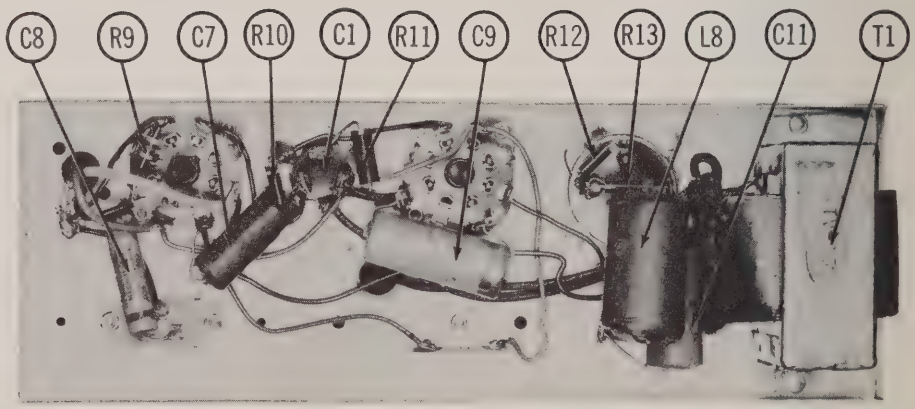
ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				AUTOMATIC PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115~	V-83	5301	859	5301	

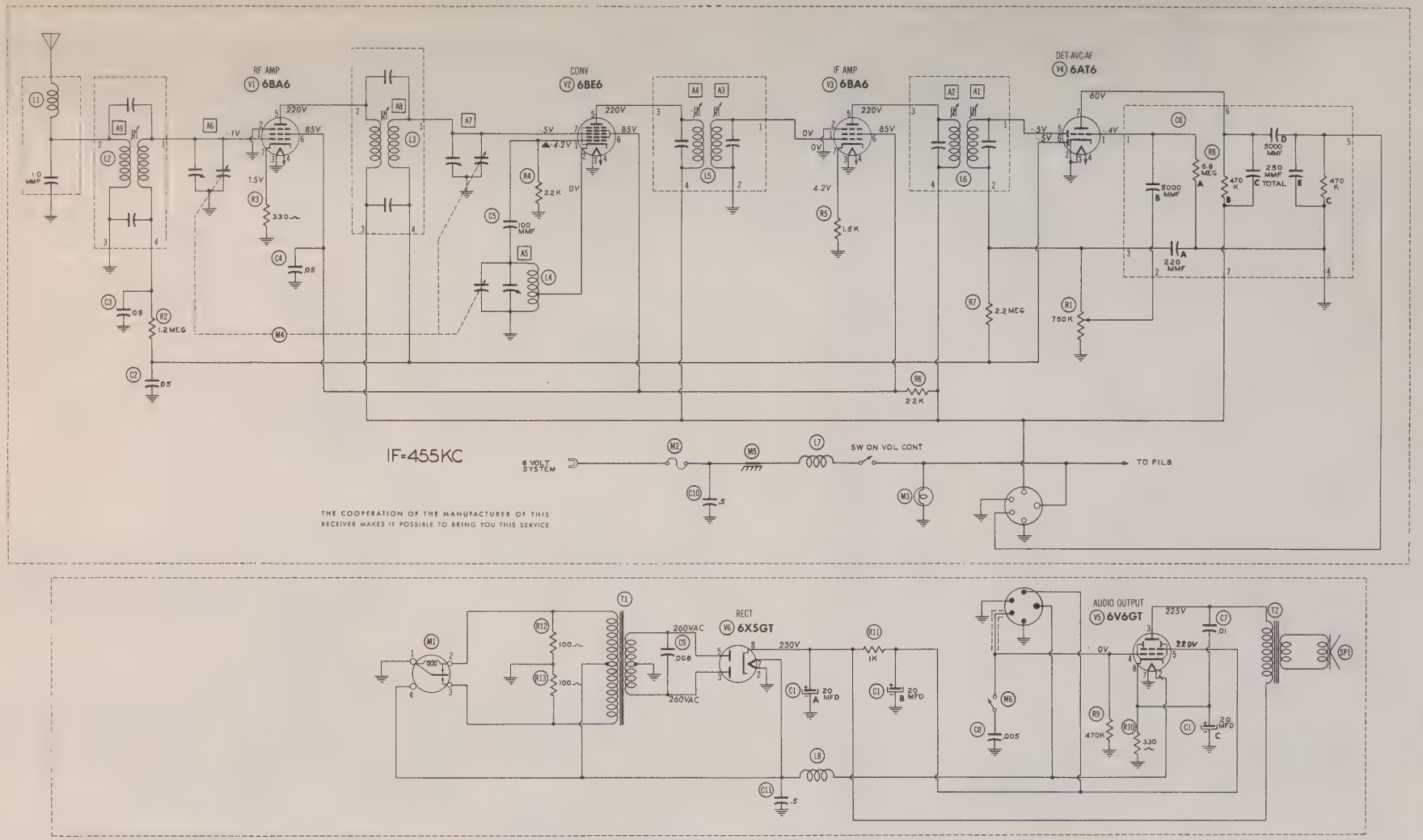
CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP
[illegible] MESA ST.
DENVER, COLORADO







RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	4.2Meg	0Ω	0Ω	.1Ω	†1KΩ	†23KΩ	330Ω	
V 2	6BE6	22KΩ	.7Ω	0Ω	.1Ω	†1KΩ	†23KΩ	3Meg	
V 3	6BA6	18Ω	0Ω	0Ω	.1Ω	†1KΩ	†23KΩ	1.5KΩ	
V 4	6AT6	6.8Meg	0Ω	0Ω	.1Ω	750KΩ	3Meg	†470KΩ	
V 5	6V6GT	INF	.1Ω	†370Ω	†1KΩ	240KΩ	INF	0Ω	330Ω
V 6	6X5GT	INF	.1Ω	400Ω	INF	440Ω	INF	0Ω	3Meg

* TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 8 OF V6

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

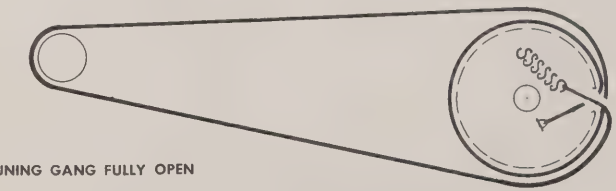
PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AUTOMATIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	A200		307014 (14A-SFE)	155014	SFE14	HD1

MISCELLANEOUS

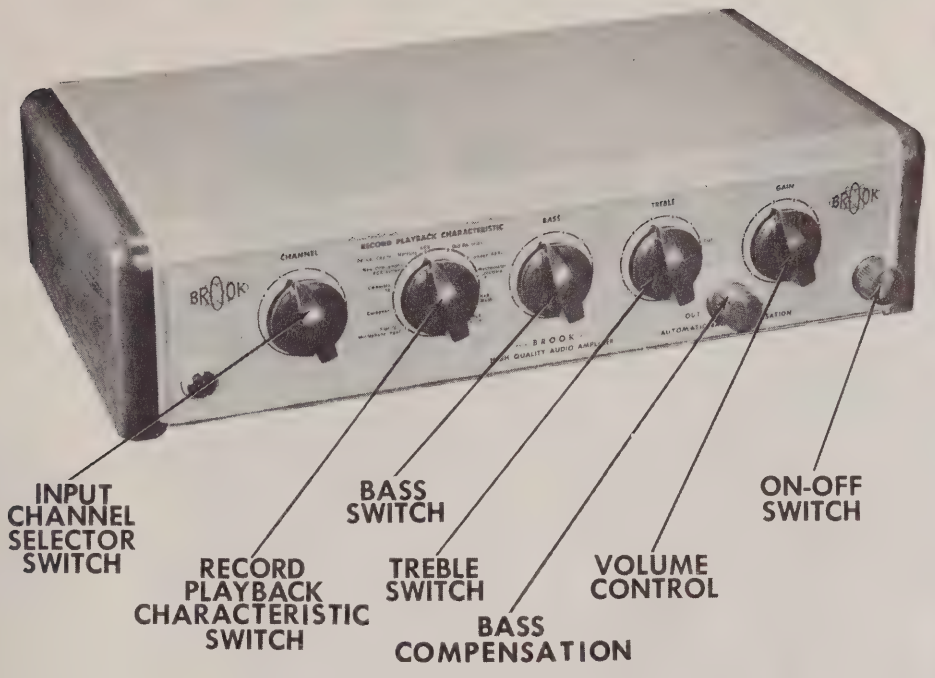
ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M3	Dial Light	T-47	Type #47
M4	Tuning Cap.	CV-100A	(23-391MMF, 24-387MMF, 35-198MMF)
M5	Spark Plate		
M6	Switch		Bass-treble
	Knob	H310E	Volume & Tuning (2 Used)
	Dial Scale	D333	
	"A" Lead Assy.	FH226	Includes fuse holder



TUNING GANG FULLY OPEN

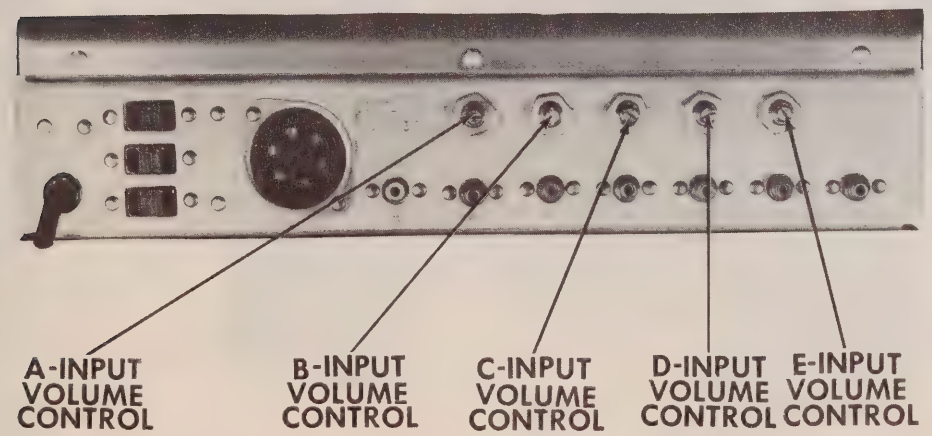
DIAL CORD DRIVE

PROPERTY OF
DENVER, COLORADO



TRADE NAME	Brook Model 4B
MANUFACTURER	Brook Electronics, Inc., 34 DeHart Place, Elizabeth, N.J.
TYPE SET	Five Channel Pre-Amplifier
TUBES (Five)	Types 6J7 Pre-Amp., (2) 6SJ7 AF Amp., (2) 6C4 Tone Amp.

THIS PRE-AMPLIFIER IS DESIGNED TO OPERATE WITH BROOK MODEL 10C & 12A BASIC AUDIO AMPLIFIERS. BROOK MODEL 10C4 IS COMPRISED OF MODELS 4B & 10C AND MODEL 12A4 IS COMPRISED OF MODELS 4B & 12A. FOR SERVICE INFORMATION ON THE POWER AMPLIFIERS - SEE PHOTOFACT SET 41 FOLDER 4 FOR MODEL 10C AND PHOTOFACT SET 89 FOLDER 3 FOR MODEL 12A.



BROOK
MODEL 4B

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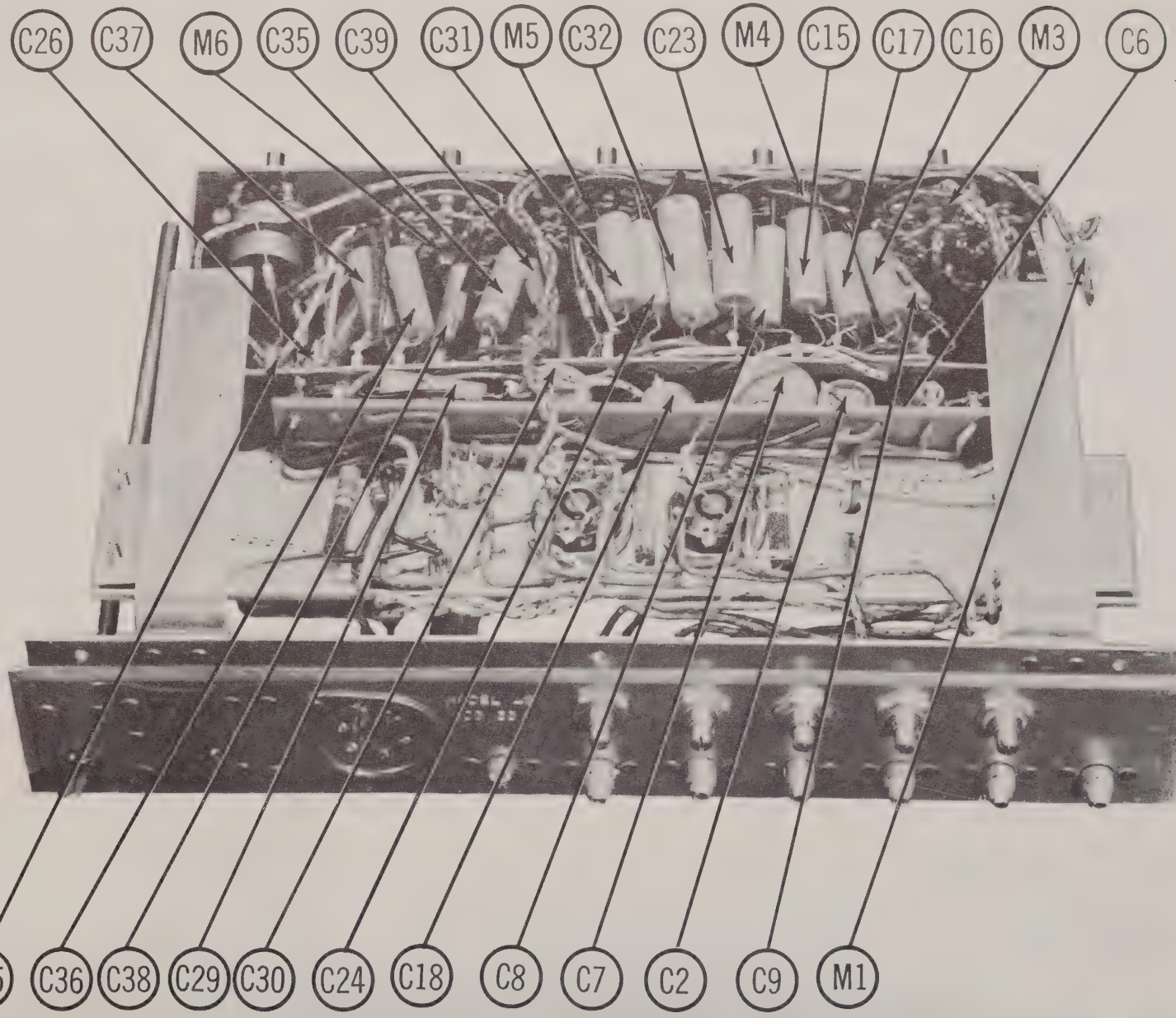
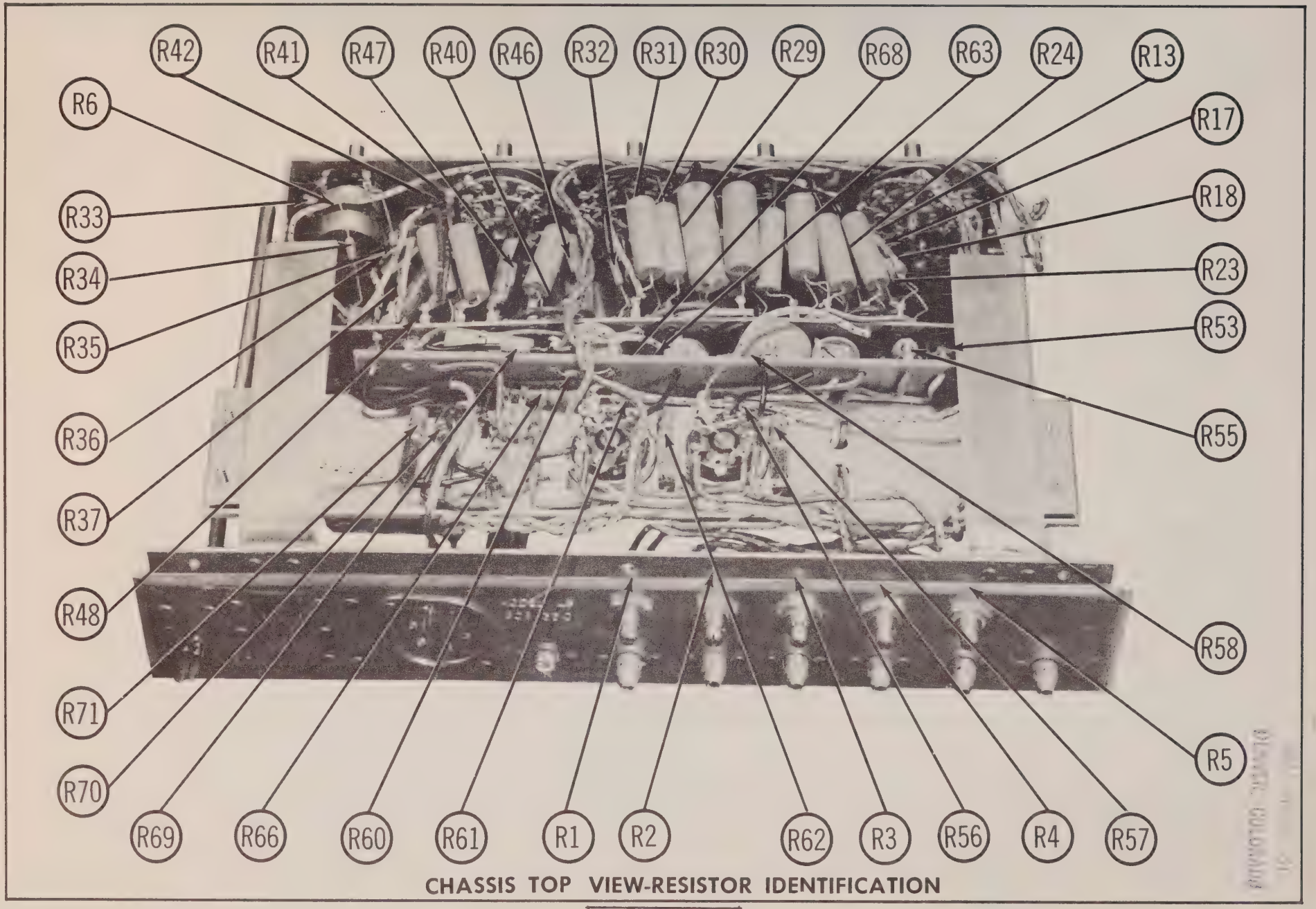
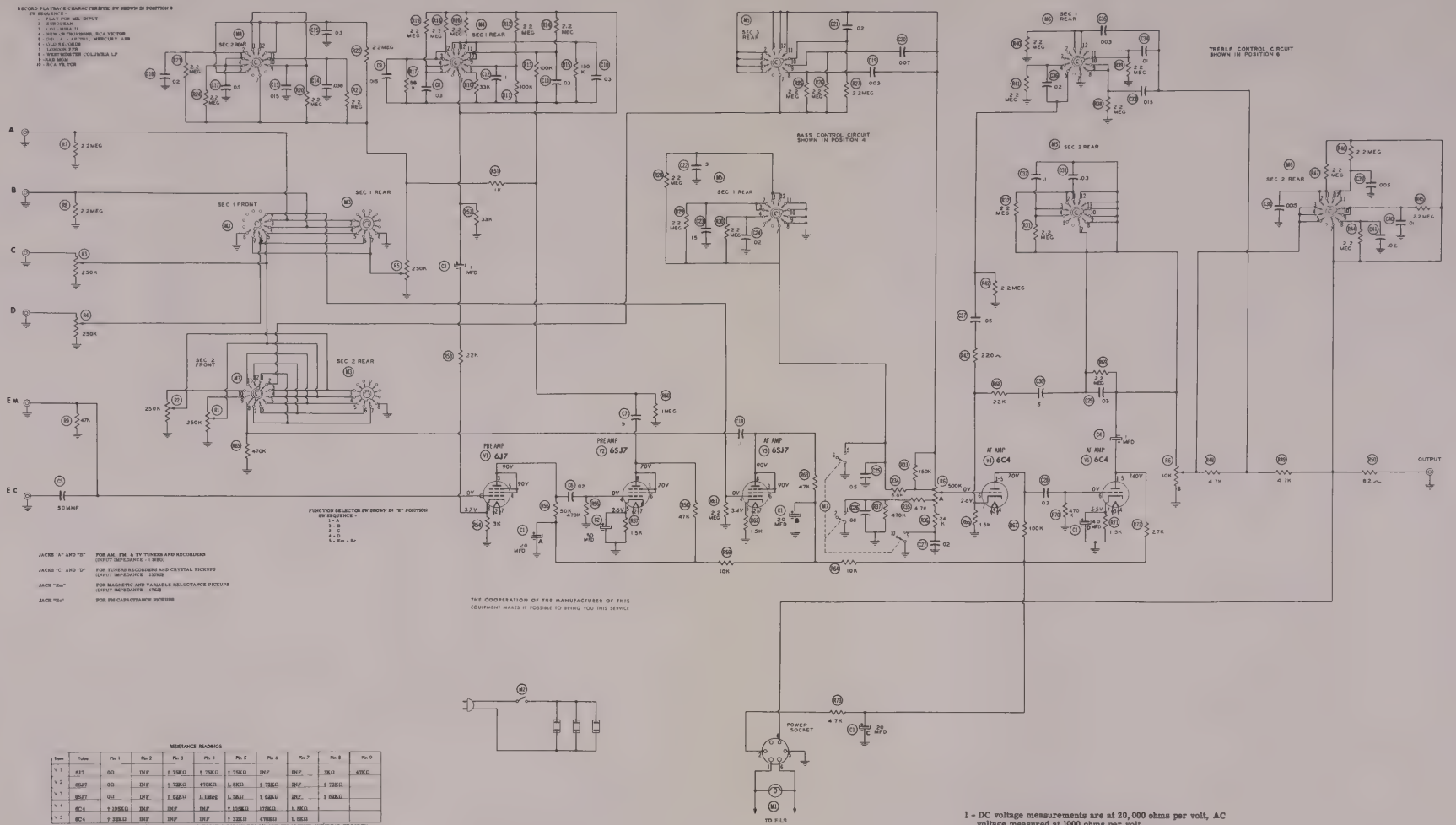


CHASSIS-TOP VIEW CAPACITOR IDENTIFICATION



CHASSIS TOP VIEW-RESISTOR IDENTIFICATION

BROOK
MODEL 4B


RECORD PLAYBACK CHARACTERISTIC (W SHOWN IN POSITION 9 (W REMAINS E):
1 - FLAT FOR MX INPUT
2 - COLUMBIA
3 - NEW AES
4 - NEW (W TROPHONE, RCA VICTOR
5 - DECCA, CAPITOL, MERCURY AES
6 - LONDON FFRR
7 - WESTMINSTER, COLUMBIA LP
8 - RAB NEW
9 - RCA VICTOR
SEC 2 REAR
SEC 1 REAR
SEC 3 REAR
TREBLE CONTROL CIRCUIT SHOWN IN POSITION 9
BASS CONTROL CIRCUIT SHOWN IN POSITION 4
SEC 1 FRONT
SEC 2 FRONT
SEC 2 REAR
PRE AMP V1 6J7
PRE AMP V2 6SJ7
AF AMP V3 6SJ7
AF AMP V4 6C4
AF AMP V5 6C4
OUTPUT
A
B
C
D
EM
EC
50MMF
FUNCTION SELECTOR (W SHOWN IN "E" POSITION (W SEQUENCE -
1 - A
2 - B
3 - C
4 - D
5 - Em - Ec
JACKS "A" AND "B" FOR AM, FM, & TV TUNERS AND RECORDERS (INPUT IMPEDANCE - 1 MEG)
JACKS "C" AND "D" FOR TUNERS RECORDERS AND CRYSTAL PICKUPS (INPUT IMPEDANCE 250KΩ)
JACK "Em" FOR MAGNETIC AND VARIABLE RELUCTANCE PICKUPS (INPUT IMPEDANCE 47KΩ)
JACK "Ec" FOR PH CAPACITANCE PICKUPS
THE COOPERATION OF THE MANUFACTURERS OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
POWER SOCKET
TO FILS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J7	0Ω	INF	↑ 75KΩ	↑ 75KΩ	↑ 75KΩ	INF	INF	3KΩ	47KΩ
V 2	6SJ7	0Ω	INF	↑ 72KΩ	470KΩ	1.5KΩ	↑ 72KΩ	INF	↑ 72KΩ	
V 3	6SJ7	0Ω	INF	↑ 62KΩ	1.1Meg	1.5KΩ	↑ 62KΩ	INF	↑ 62KΩ	
V 4	6C4	↑ 105KΩ	INF	INF	INF	↑ 105KΩ	175KΩ	1.5KΩ		
V 5	6C4	↑ 33KΩ	INF	INF	INF	↑ 33KΩ	470KΩ	1.5KΩ		

↑ MEASURED FROM PIN 8 OF POWER PLUG (115 VAC INPUT PIN #8) (CT FILAMENT WINDING GROUND)
ALL MEASUREMENTS TAKEN IN CHANNEL "A" POSITION AUTOMATIC BASS COMPENSATION "OFF" AND BASS CONTROL IN POSITION NO. 1.

1 - DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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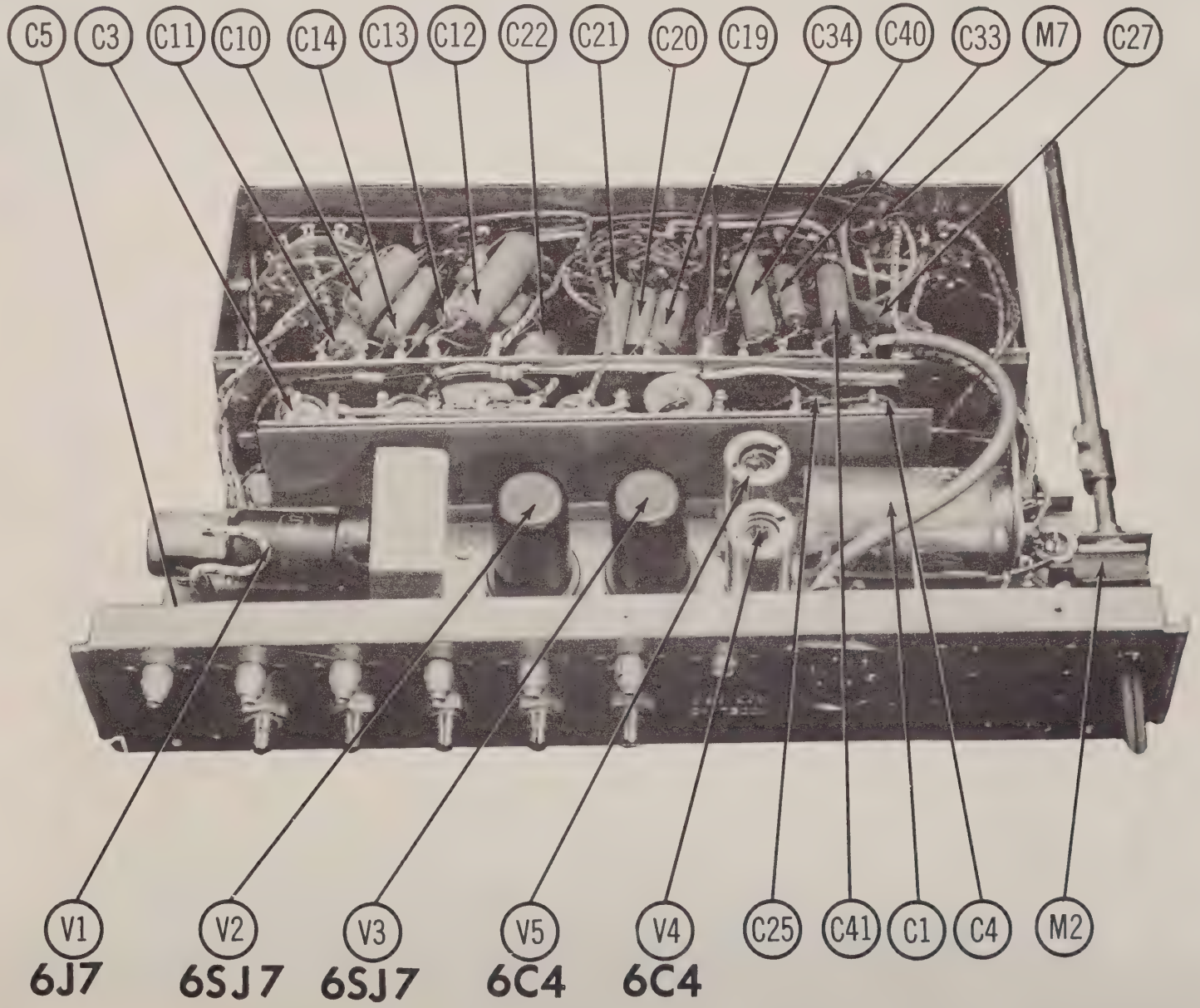
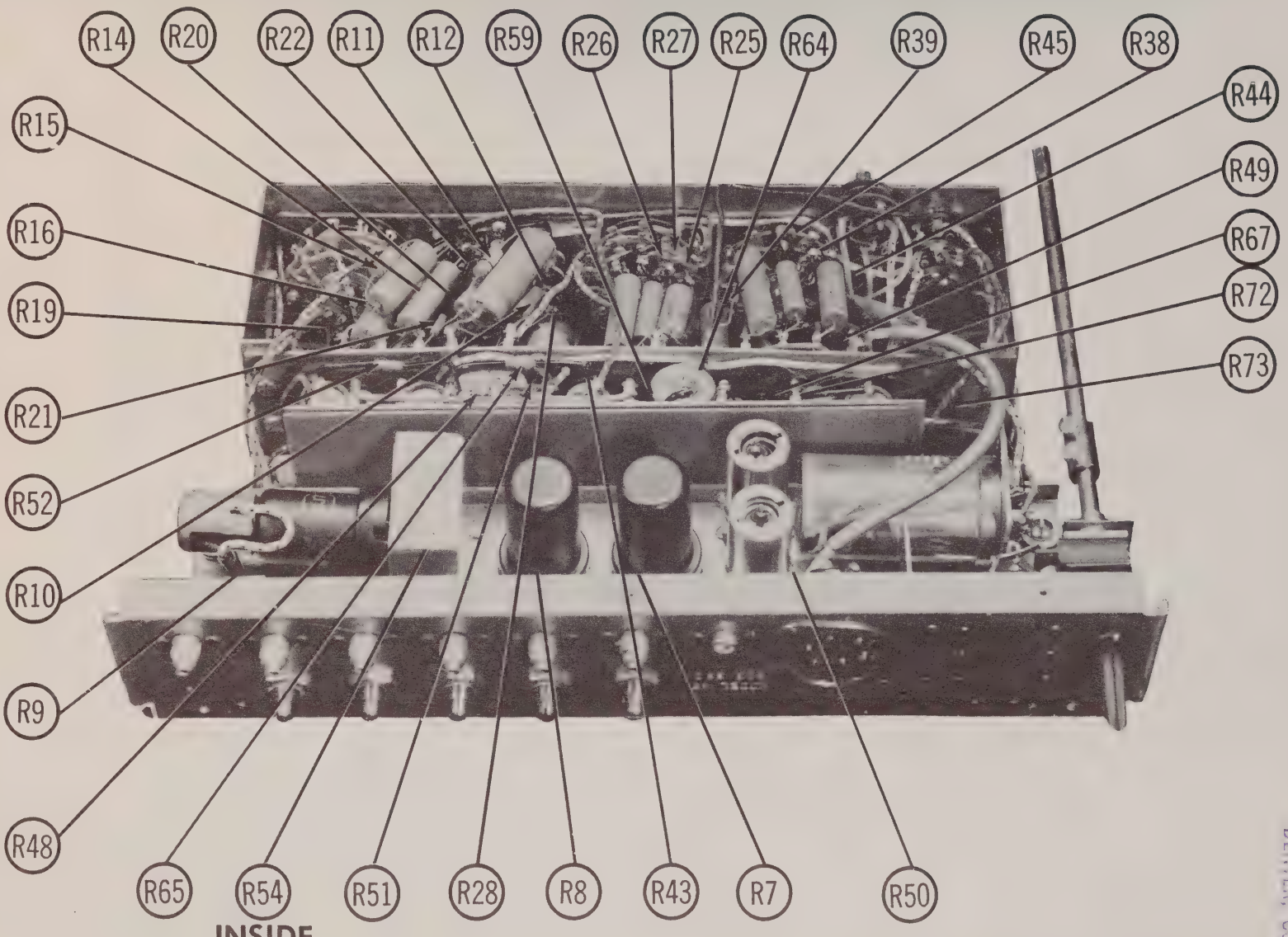
230-4



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROFFITT'S INC.
L. F. BLANKENSHIP
3321 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		BROOK PART No.	STANDARD REPLACEMENT		
V1	Pre-Amplifier	6J7	6J7	7R	
V2	AF Amplifier	6SJ7	6SJ7	8N	
V3	AF Amplifier	6SJ7	6SJ7	8N	
V4	Tone Amplifier	6C4	6C4	6BG	
V5	Tone Amplifier	6C4	6C4	6BG	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	BROOK PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	475								
B	▲20	475								
C	▲20	475								
D	40	50								
C2	50	50		PRS50/50		BR505		TC39	TVA-1308	
C3	1.0	450		E26A141		BR145			R1260	
C4	1.0	450		E26A141		BR145			R1260	
C5	50	500		1468-00005		5W5Q5		MC225	1FM-45	
C6	.02	600		P688-02		PJ6S2		PT612	6TM-S2	
C7	.5	600		P688-5		PJ6P5		PT605	6TM-P5	
C8	.02	400		P488-02		PJ4S2		PT412	4TM-S2	
C9	.015	200		P288-015		PJ6S15		TP400	6TM-S15	
C10	.03	600		P688-03		PJ6S3		PT613	6TM-S3	
C11	.03	600		P688-03		PJ6S3		PT613	6TM-S3	
C12	.1	200		P288-1		PJ2P1		PT401	2TM-P1	
C13	.015	200		P288-015		PJ6S15		TP400	6TM-S15	
C14	.036	200								
C15	.03	600		P688-03		PJ6S3		PT613	6TM-S3	
C16	.02	400		P488-02		PJ4S2		PT412	4TM-S2	
C17	.05	400		P488-05		PJ4S5		PT415	4TM-S5	
C18	.1	600		P688-1		PJ6P1		PT601	6TM-P1	
C19	.003	400		P688-003		PJ6D3		PT623	6TM-D3	
C20	.007	200								
C21	.02	400		P488-02		PJ412		PT412	4TM-S2	
C22	.3	200								
C23	.15	200		P288-15		PTE4P15			2TM-P15	
C24	.02	400		P488-02		PJ412		PT412	4TM-S2	
C25	.05	400		P488-05		PJ415		PT415	4TM-S5	
C26	.06	200		484-06		PTE6S6		PT616	6TM-S6	
C27	.02	400		P488-02		PJ4S2		PT411	4TM-S2	
C28	.03	600		P688-03		PJ6S3		PT613	6TM-S3	
C29	.03	600		P688-03		PJ6S3		PT613	6TM-S3	
C30	.5	400		P488-5		PJ4P5		PT405	4TM-P5	
C31	.03	600		P688-03		PJ6S3		PT613	6TM-S3	
C32	.1	200		P288-1		PJ2P1		PT401	2TM-P1	
C33	.015	200		P288-015		PJ6S15		TP400	6TM-S15	
C34	.01	600		P688-01		PJ6S1		PT611	6TM-S1	
C35	.003	400		P688-003		PJ6D3		PT623	6TM-D3	
C36	.02	400		P488-02		PJ4S2		PT412	4TM-S2	
C37	.05	400		P488-05		PJ4S5		PT415	4TM-S5	
C38	.0015	200		P688-0015		PTE6D15			6TM-D15	
C39	.005	600		P688-005		PJ6D5		PT625	6TM-D5	
C40	.01	600		P688-01		PJ6S1		PT611	6TM-S1	
C41	.02	400		P488-02		PJ4S2		PT412	4TM-S2	

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BROOK PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	250KΩ	½	6151505	Q13-130	AG-64-Z	AB-51	U-44	Input volume "A"
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R1A
R2A	250KΩ	½	6151505	Q13-130	AG-64-Z	AB-51	U-44	Input Volume "B"
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R2A
R3A	250KΩ	½	6151505	Q13-130	AG-64-Z	AB-51	U-44	Input volume "C"
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	250KΩ	½	6151505	Q13-130	AG-64-Z	AB-51	U-44	Input volume "D"
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	250KΩ	½	6151505	Q13-130	AG-64-Z	AB-51	U-44	Phono volume
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	500KΩ	½	6271739	Q18-133XX				Volume-tapped @ 100KΩ & 200KΩ - Panel
B	10KΩ	½		M11-116				Volume- Rear

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BROOK PART No.	IRC PART No.	
R7	2.2Meg	½		BTS-2.2Meg	
R8	2.2Meg	½		BTS-2.2Meg	
R9	47KΩ	½		BTS-47K	
R10	33KΩ	1		BTA-33K	
R11	100KΩ	½		BTS-100K	
R12	2.2Meg	½		BTS-2.2Meg	
R13	100KΩ	½		BTS-100K	
R14	2.2Meg	½		BTS-2.2Meg	
R15	150KΩ	½		BTS-150K	
R16	2.2Meg	½		BTS-2.2Meg	
R17	56KΩ	½		BTS-56K	
R18	2.2Meg	½		BTS-2.2Meg	
R19	2.2Meg	½		BTS-2.2Meg	
R20	2.2Meg	½		BTS-2.2Meg	
R21	2.2Meg	½		BTS-2.2Meg	
R22	2.2Meg	½		BTS-2.2Meg	
R23	2.2Meg	½		BTS-2.2Meg	
R24	2.2Meg	½		BTS-2.2Meg	
R25	2.2Meg	½		BTS-2.2Meg	
R26	2.2Meg	½		BTS-2.2Meg	
R27	2.2Meg	½		BTS-2.2Meg	
R28	2.2Meg	½		BTS-2.2Meg	
R29	2.2Meg	½		BTS-2.2Meg	
R30	2.2Meg	½		BTS-2.2Meg	
R31	2.2Meg	½		BTS-2.2Meg	
R32	2.2Meg	½		BTS-2.2Meg	
R33	150KΩ	½		BTS-150K	
R34	6800Ω	½		BTS-6800	
R35	4700Ω	½		BTS-4700	
R36	24KΩ	½			
R37	470KΩ	½		BTS-470K	
R38	2.2Meg	½		BTS-2.2Meg	
R39	2.2Meg	½		BTS-2.2Meg	
R40	2.2Meg	½		BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BROOK PART No.	IRC PART No.	
R41	2.2Meg	½		BTS-2.2Meg	
R42	2.2Meg	½		BTS-2.2Meg	
R43	220Ω	½		BTS-220	
R44	2.2Meg	½		BTS-2.2Meg	
R45	2.2Meg	½		BTS-2.2Meg	
R46	2.2Meg	½		BTS-2.2Meg	
R47	2.2Meg	½		BTS-2.2Meg	
R48	4700Ω	½		BTS-4700	
R49	4700Ω	½		BTS-4700	
R50	82Ω	½		BTS-82	
R51	1000Ω	½		BTS-1000	
R52	33KΩ	½		BTS-33K	
R53	22KΩ	½		BTS-22K	
R54	3000Ω	2			
R55	50KΩ	10			
R56	470KΩ	½		BTS-470K	
R57	1500Ω	2		BW-2-1500	
R58	47KΩ	1		BTA-47K	
R59	10KΩ	1		BTA-10K	
R60	1Meg	½		BTS-1Meg	
R61	2.2Meg	½		BTS-2.2Meg	
R62	1500Ω	2		BW-2-1500	
R63	47KΩ	1		BTA-47K	
R64	10KΩ	1		BTA-10K	
R65	470KΩ	½		BTS-470K	
R66	1500Ω	2		BW-2-1500	
R67	100KΩ	1		BTA-100K	
R68	22KΩ	½		BTS-22K	
R69	2.2Meg	½		BTS-2.2Meg	
R70	470KΩ	½		BTS-470K	
R71	1500Ω	2		BW-2-1500	
R72	27KΩ	1		BTA-27K	
R73	4700Ω	1		BTA-4700	

MISCELLANEOUS

ITEM No.	PART NAME	BROOK PART No.	NOTES
M1	Pilot Lamp		Type #51
M2	Switch		On/Off Switch (SPST Toggle)
M3	Switch		Channel (Input) Selector, Rotary
M4	Switch		Record characteristic compensation, rotary
M5	Switch		Bass Control, rotary
M6	Switch		Treble control, rotary
M7	Switch		Automatic bass compensation off/on (3PDT Rotary)

PHOTOFACT* Folder

*TRADE MARK

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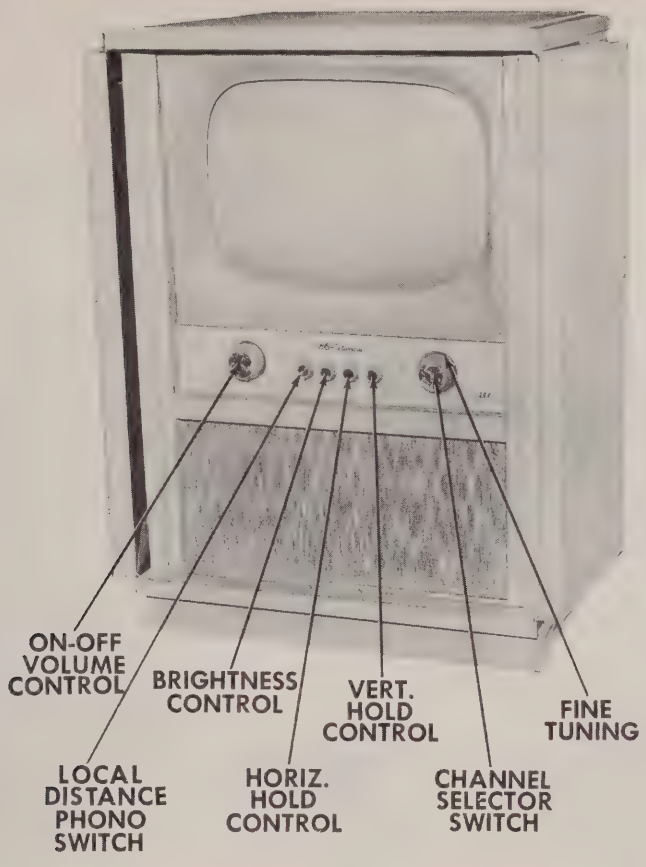

CBS-COLUMBIA
MODEL 22C61B (Ch. 1021-2)

TRADE NAME	CBS-Columbia Model 22C61B (Ch. 1021-2)
MANUFACTURER	CBS-Columbia, 170-53rd St., Brooklyn 32, N. Y.
TYPE SET	Television Receiver
TUBES	Twenty-five
POWER SUPPLY	110-120 volts AC-60 cycle RATING 2 Amp. @ 117 volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 25.75MC, Sound IF 21.25MC (Intercarrier)

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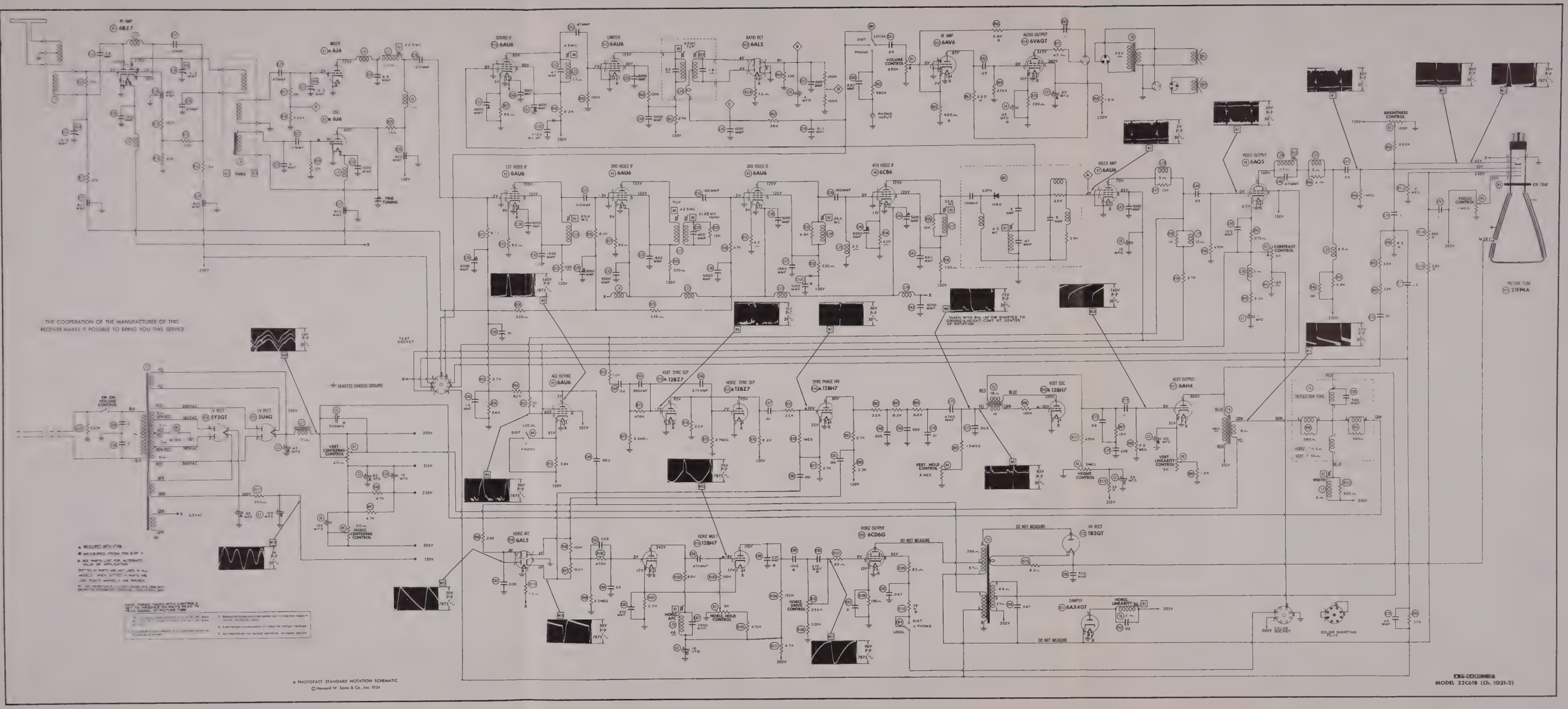
RF AMP V1 6BZ7
MIXER V2A 6J6
OSC V2B 6J6
SOUND IF V10 6AU6
LIMITER V11 6AU6
RATIO DET V12 6AL5
AF AMP V13 6AV6
AUDIO OUTPUT V14 6V6GT
1ST VIDEO IF V3 6AU6
2ND VIDEO IF V4 6AU6
3RD VIDEO IF V5 6AU6
4TH VIDEO IF V6 6CB6
VIDEO AMP V7 6AU6
VIDEO OUTPUT V8 6AQ5
PICTURE TUBE V9 21EP4A
AGC KEYING V9 6AU6
VERT SYNC SEP V11A 12BZ7
HORZ SYNC SEP V11B 12BZ7
SYNC PHASE INV V10A 12BH7
VERT OSC V10B 12BH7
VERT OUTPUT V11 6AH4
HORZ AFC V10 6AL5
HORZ MULT V11 12BH7
HORZ OUTPUT V12 6CD6G
HV RECT V12 1B3GT
DAMPER V10 6AX4GT
SW RECT V14 5Y3GT
LV RECT V13 5U4G
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
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DO NOT MEASURE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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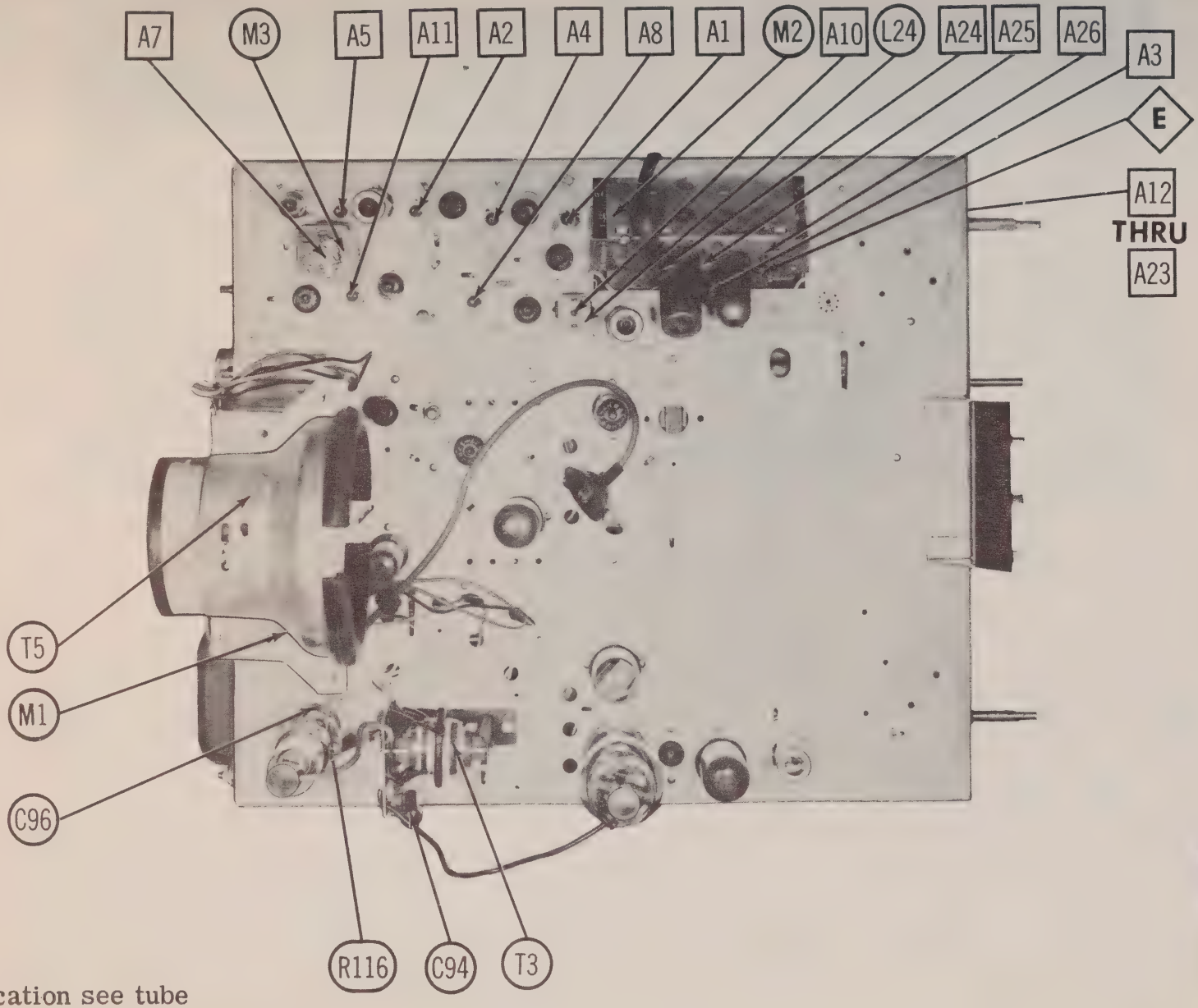

For tube location see tube placement chart page 5.

CHASSIS TOP VIEW

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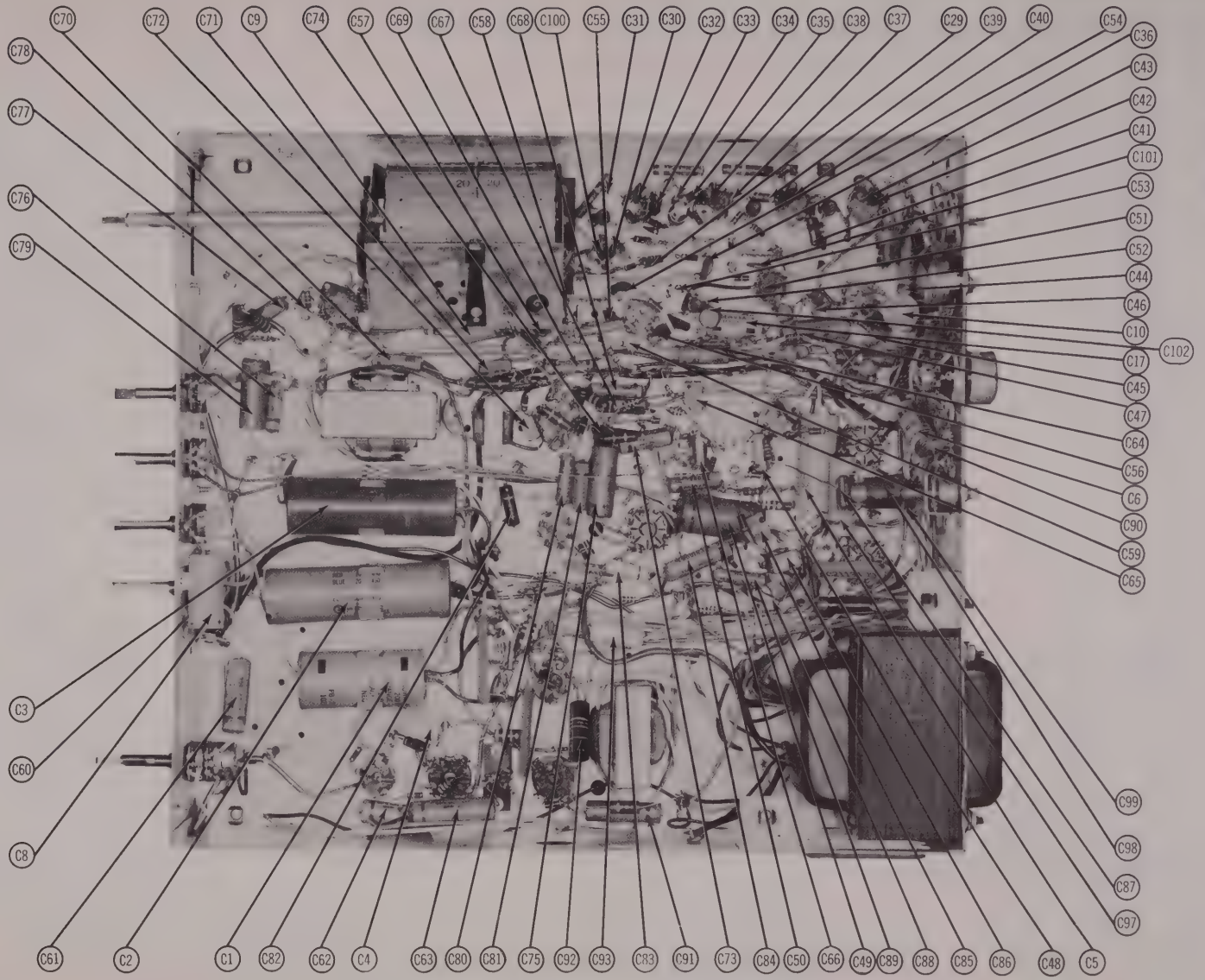

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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TUBE PLACEMENT CHART

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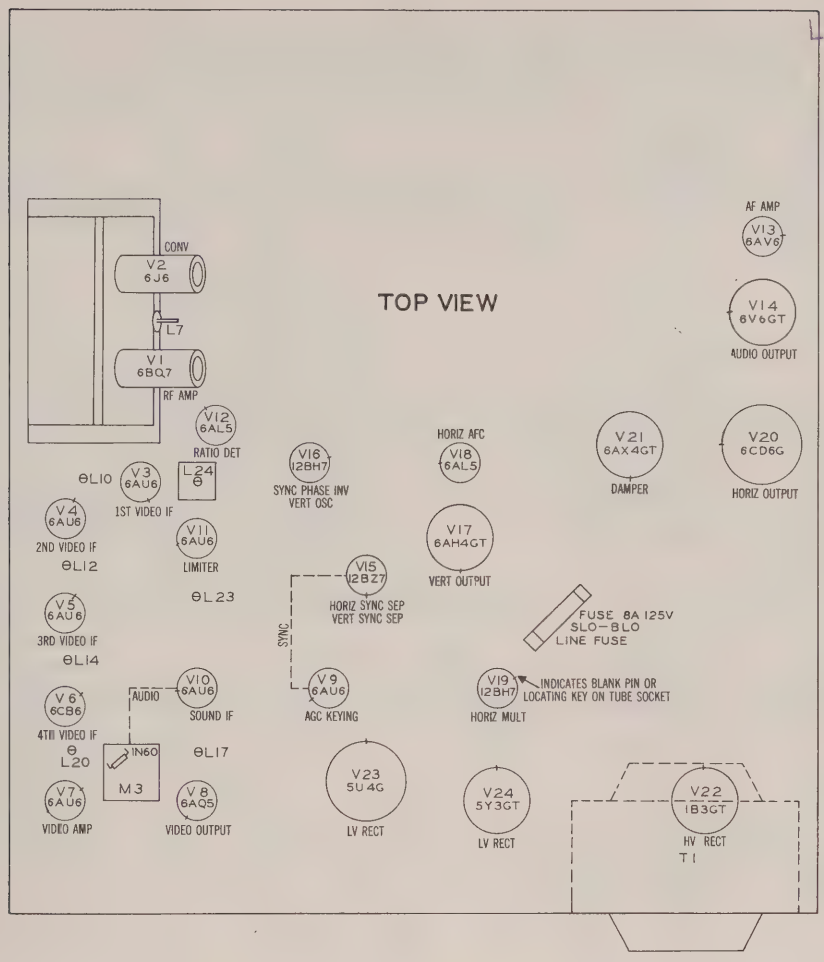

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V23, V24 Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V7, V8, V25**
Has pic, no sound - **V10, V11, V12, V13, V14**
Overloaded picture - **V9**

SYNC FAILURE
No vert. sync - **V15, V16, V17**
No horiz. sync - **V15, V16, V18, V19**
No vert. or horiz. sync - **V16**

SWEEP FAILURE
No raster, has sound - **V19, V20, V21, V22, V25**
No vertical deflection - **V16, V17**
Poor vert. linearity or foldover - **V16, V17**
Poor horiz. linearity or foldover - **V19, V20, V21**
Narrow picture - **V19, V20, V21, V22, V23, V24**
Vert. off freq. - **V15, V16, V17**
Horiz. off freq. - **V15, V16, V18, V19**

CBS-COLUMBIA
MODEL 22C61B (Ch. 1021-2)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the color plug socket on rear of chassis.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.4MC (Unmod)	Any	DC probe to point (A). Common to chassis.	A1, A2	Adjust for maximum deflection. Attenuate generator output to maintain approximately 3 volts at VTVM.
2.	"	"	22.5MC	"	"	A3, A4	"
3.	"	"	23.6MC	"	"	A5	"
4.	"	"	21.25MC	"	"	A6	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 3 volt battery to the ungrounded side of C50. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Calibrate scope for 5 volts peak to peak deflection (approximately 1/4 of the peak to peak voltage of the 6.3AC filament voltage.)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis	2 4MC (10MC Swp)	21.25MC 25.75MC	Any	Vert. amp. thru 10KΩ to point (A). Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A1 thru A5 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B). Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
7.	"	"	"	"	DC probe to point (C). Common to point (D).	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to point (A). Low side to chassis.	.45MC (450KC Swp)	4.5MC	Any	Vert. amp. to point (B). Low side to chassis.	A7, A8, A9	Disconnect stabilizer capacitor C9. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
7.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A10	Reconnect capacitor C9. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. Slightly retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any	Not used	A-11	If A-11 is misadjusted a 4.5MC dot pattern will be visible on the picture screen. Adjust A-11 for MINIMUM dot pattern.

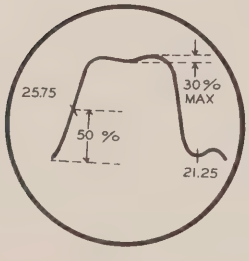

FIG. 1

FIG. 2

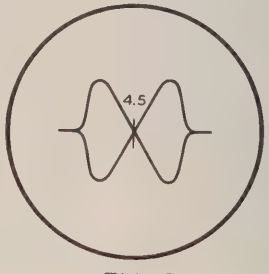

FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

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OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached through a hole at the upper right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the bias battery as under video IF alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 10KΩ to point (A). Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A13	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A14	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A15	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A16	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A17	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A18	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A19	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A20	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A21	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A22	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A23	

RF AND MIXER ALIGNMENT

Connect bias battery as under Video IF alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205. 25MC 209. 75MC	12	Vert. amp. thru 10KΩ to point (E). Low side to chassis.	A24, A25 A26	Adjust for maximum response with bandwidth similar to Fig. 5.
11.	"	"	213MC (10MC Swp)	211. 25MC 215. 75MC	13	"	"	Check for response similar to Fig. 5. If markers fall below 70% on any channel, make slight compromise adjustments of A24, A25 and A26 with channel switch set to that channel. Then recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199. 25 203. 75MC	11			
			195MC (10MC Swp)	193. 25MC 197. 75MC	10			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp)	77. 25MC 81. 75MC	5			
			69MC (10MC Swp)	67. 25MC 71. 75MC	4			
			63MC (10MC Swp)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp)	55. 25MC 59. 75MC	2			

FIG. 4

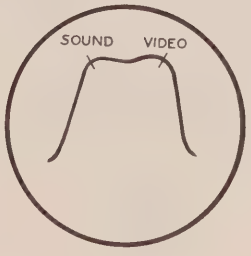
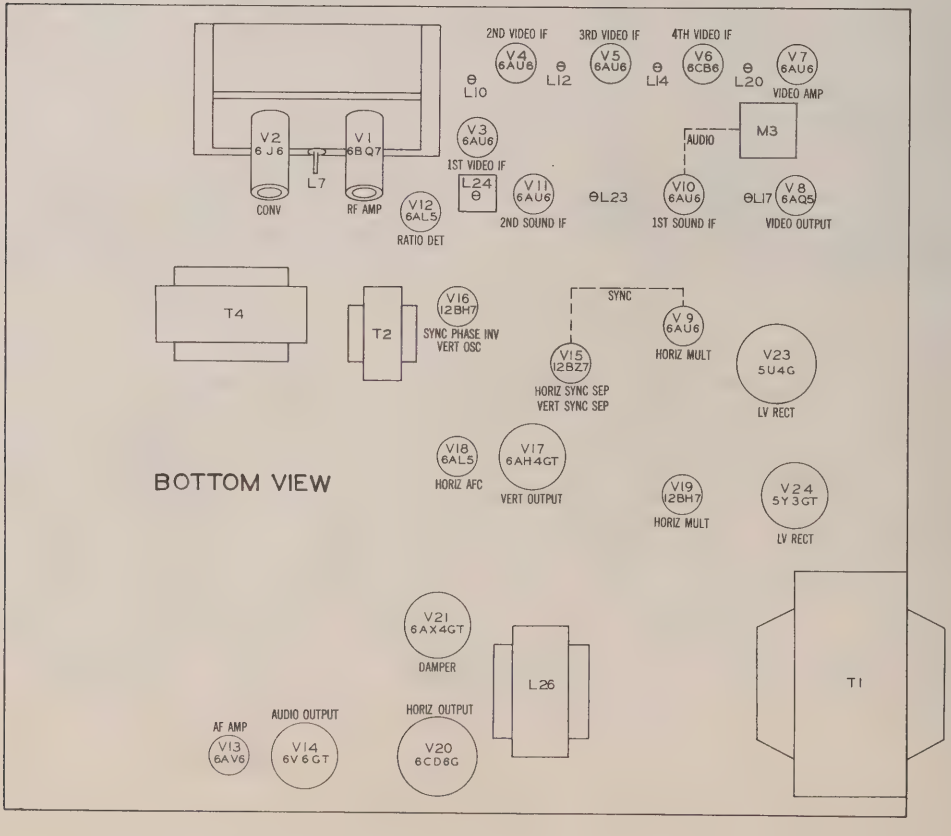


FIG. 5

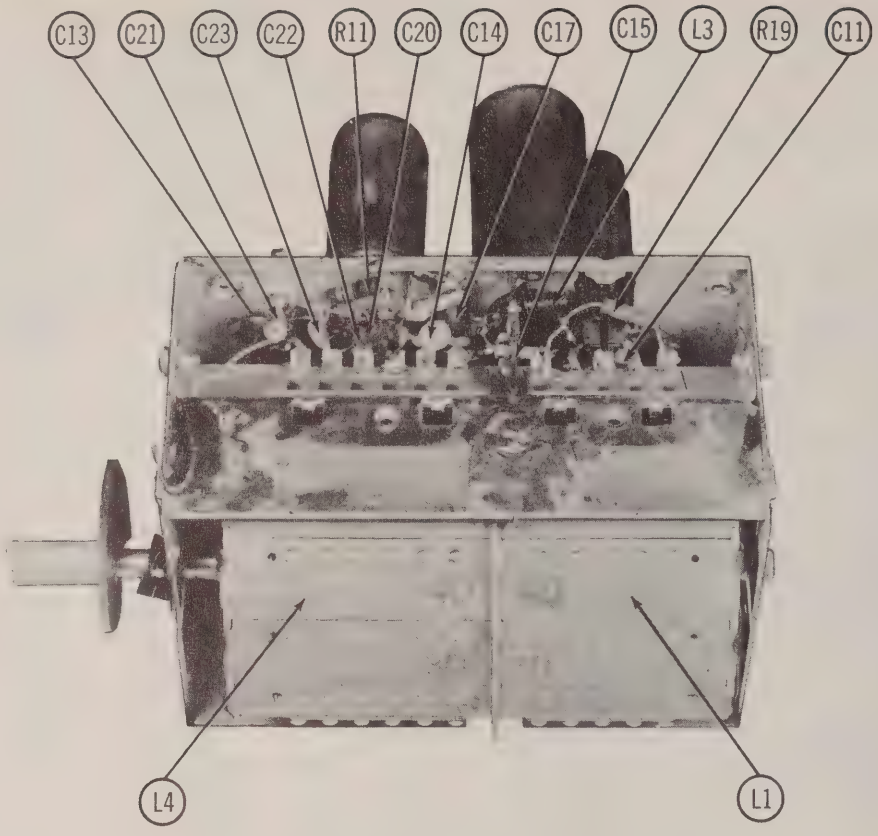
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	INF	110KΩ	0Ω	.1Ω	0Ω	† 4KΩ	160KΩ	INF	0Ω
V 2	6J6	# 15. 3KΩ	#300Ω	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6AU6	65KΩ	0Ω	0Ω	.1Ω	# 630Ω	# 630Ω	82Ω		
V 4	6AU6	66KΩ	0Ω	.1Ω	0Ω	# 630Ω	# 630Ω	82Ω		
V 5	6AU6	65KΩ	0Ω	.1Ω	0Ω	# 630Ω	# 630Ω	82Ω		
V 6	6CB6	2. 5Ω	220Ω	.1Ω	0Ω	# 630Ω	# 630Ω	0Ω		
V 7	6AU6	3. 9KΩ	0Ω	.1Ω	0Ω	■ # 8. 6KΩ	# 5. 6KΩ	0Ω		
V 8	6AQ5	470KΩ	450Ω	.1Ω	0Ω	† 6. 8KΩ	# 300Ω	INF		
V 9	6AU6	■ # 41. 6KΩ	■ # 5. 9KΩ	0Ω	.1Ω	138KΩ	† 100Ω	■ # 5. 9KΩ		
V 10	6AU6	1. 5Ω	0Ω	0Ω	.1Ω	# 8. 5KΩ	# 8. 5KΩ	82Ω		
V 11	6AU6	100KΩ	0Ω	.1Ω	0Ω	# 3KΩ	# 100KΩ	0Ω		
V 12	6AL5	INF	INF	.1Ω	0Ω	0Ω	0Ω	33KΩ		
V 13	6AV6	250KΩ	820Ω	0Ω	.1Ω	0Ω	0Ω	† 220KΩ		
V 14	6V6GT	† 100Ω	0Ω	† 2KΩ	† 1. 6KΩ	470KΩ	6. 4KΩ	.1Ω	330Ω	
V 15	12BZ7	# 7K	2. 7Meg	0Ω	.1Ω	.1Ω	# 7K	2. 7Meg	0Ω	0Ω
V 16	12BH7	† 1. 3Meg	2. 4Meg	0Ω	.1Ω	.1Ω	# 6. 3KΩ	1Meg	2. 7KΩ	0Ω
V 17	6AH4GT	2. 2Meg	0Ω	INF	INF	† 1KΩ	INF	.1 Ω	3KΩ	
V 18	6AL5	3. 4Meg	3. 4Meg	.1Ω	0Ω	33KΩ	0Ω	33KΩ		
V 19	12BH7	† 157K	102KΩ	2. 2KΩ	.1Ω	.1Ω	† 12KΩ	3. 8Meg	2. 2Ω	0Ω
V 20	6CD6G	† 39KΩ	0Ω	150Ω	360KΩ	360KΩ	INF	.1Ω	† 39KΩ	TOP CAP ¶ 6Ω
V 21	6AX4GT	INF	INF	1. 9Meg	INF	† 95Ω	1. 2Meg	.1Ω	0Ω	
V 22	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ¶ 356Ω
V 23	5U4G	1. 2Meg	35KΩ	INF	22Ω	INF	21Ω	INF	35KΩ	
V 24	5Y3GT	† 90Ω	22KΩ	† 75Ω	13Ω	INF	13Ω	† 85Ω	22KΩ	
V 25	21FP4	0Ω	1 Meg	PIN 6 28Ω	PIN 10 ¶ 660KΩ	PIN 11 260KΩ	PIN 12 .1Ω			

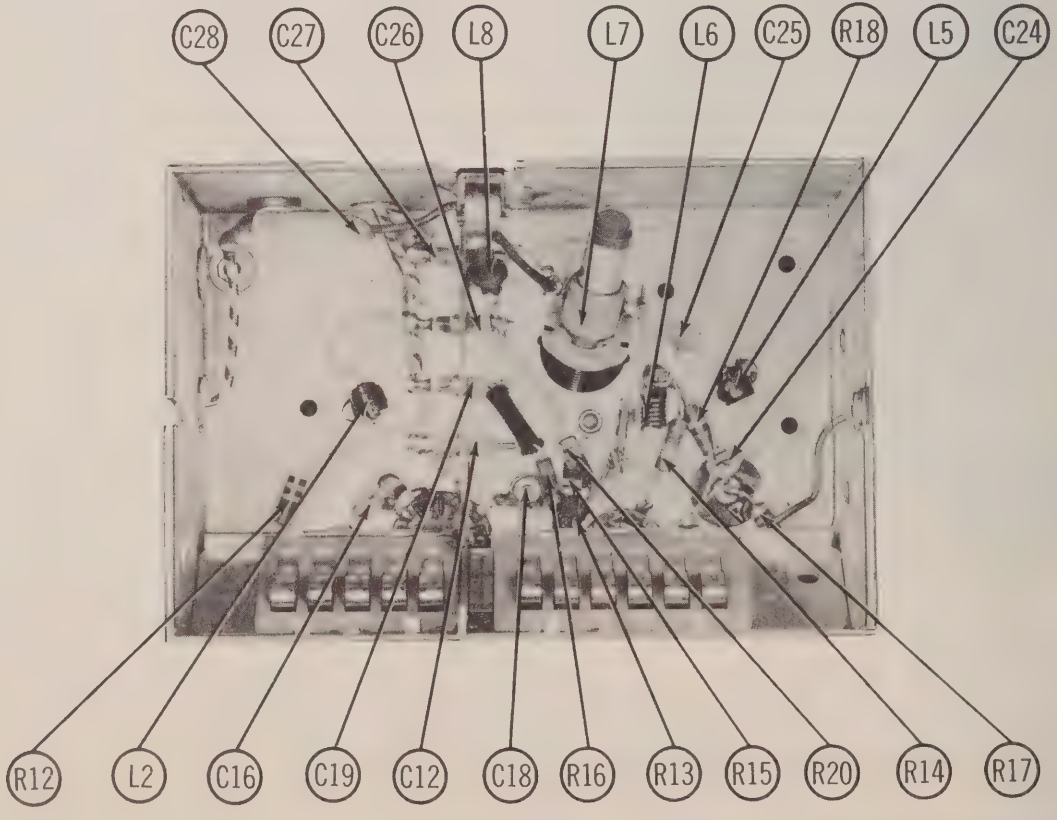
† MEASURED FROM PIN 8 OF V23.
# MEASURED FROM PIN 8 OF V24.
¶ MEASURED FROM PIN 3 OF V21.
■ M4 in local position.



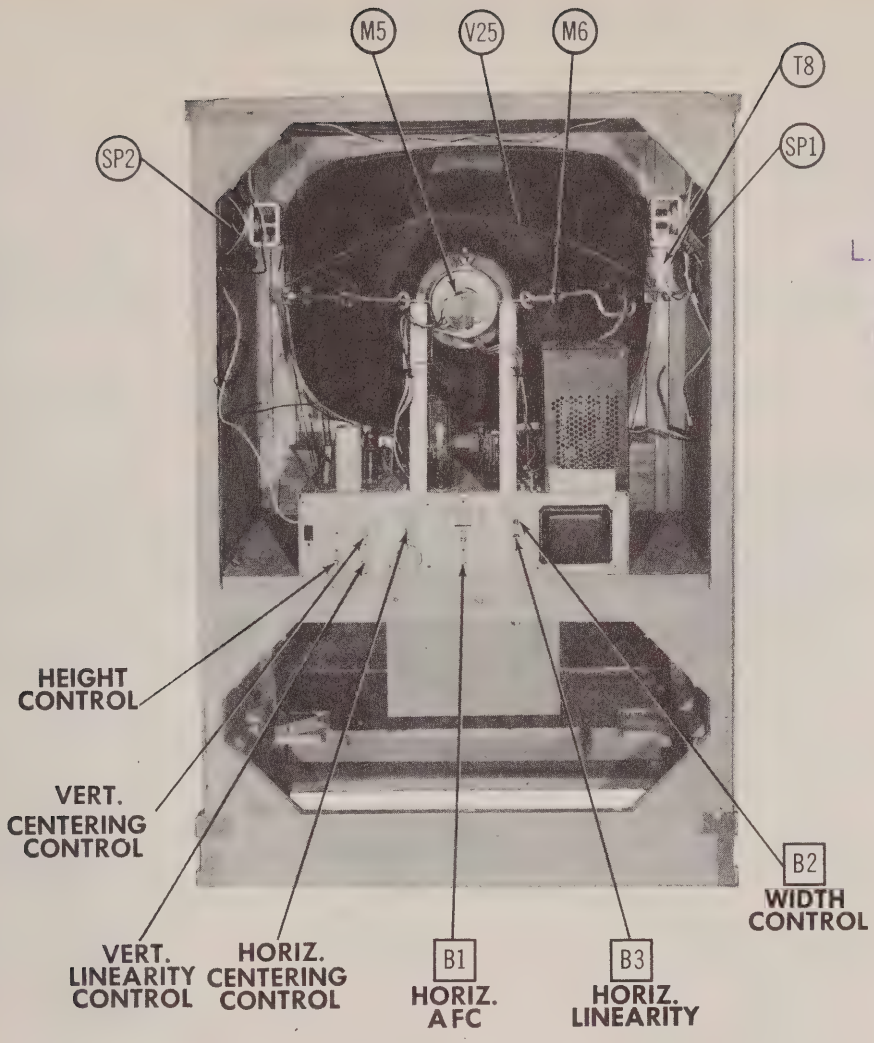
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP
3824 MEADE ST.
DENVER, COLORADO

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

If the horizontal hold control fails to maintain sync, set it at the middle of its range and adjust the horizontal AFC slug (B1) until the picture is in sync. Check other channels and, if necessary, readjust B1 slightly for best sync on all channels.

Adjust the horizontal drive control counter clockwise as far as possible without the presence of vertical white line or compression of the center of the picture.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

See "Loss of High Voltage".

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, V21, V23 and V24. Check adjustment of the horizontal drive control, B3 and B2. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check R110, R112, R108, C92, C93, C94, T3, T5A and other associated circuit components.	Check C86, C87, C89, C90, R104, R10 and other associated circuit components.

DRIVE LINES

Check by substitution V19, V20 and V21. Check C88, C89, C90, T3, T5A, C2D, C93, C94 and other associated circuit components.

COMPRESSED LEFT SIDE

Check by substitution V20 and V21. Check T3, T5A and other components associated with the horizontal output and damper stages.

FOLDS

Check by substitution V19, V20 and V21. Proceed as outlined under "Drive Lines".

XMAS TREE EFFECT

Substitute V19. Check C86, C87, L25 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V16 and V17. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B and other associated circuit components.	Check C73, C75, R88, R122 and other associated circuit components.

INSUFFICIENT SWEEP

Check by substitution V16 and V17. Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V16 and V17. Check R88, R87, C73, C75 and other associated circuit components.

COMPRESSED AT TOP

Substitute V16 and V17. Check T4, T5B, C3B and other associated components.

FOLDS

Check by substitution V16 and V17. Check components associated with these stages.

SYNC

LOSS OF HORIZONTAL AND VERTICAL SYNC

Check by substitution V15 and V16. Check components associated with V15 and V16A for failure or change of value.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V15 and V16. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check components associated with V16B.	Check components associated with V15 and V16A.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V18 and V19. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check components associated with V18 and V19. especially C82, C86, C87.	Check components associated with V16 especially C80 and C81.

HORIZONTAL BENDING

Check by substitution V18, V19 and V20. Check horizontal AFC filter components for failure or change of value.

VIDEO

LOSS OF VIDEO

Check by substitution V7 and V8. Check components associated with these stages. Check picture tube.

SOUND BARS (4.5MC Beat)

Check adjustment of local oscillator. Check adjustment A11. Check video IF alignment.

NEGATIVE PIX

Check by substitution V7, V8 and V9. Check associated circuit components especially AGC network components.

POOR CONTRAST

Check by substitution V7 and V8. Check picture tube and other associated circuit components.

SMEAR

Check by substitution V7 and V8. Check video detector crystal and assembly. Check C44, C47, L18, L19, L21, R39, R40, R45, R46, picture tube and other associated components for failure or change of value.

WIDE BLACK BAR ACROSS PIX

Check V1, V2, V3, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V10, V11, V12, V13 and V14. Check stages of V13 and V14 using audio signal generator. Connect signal across R1B.

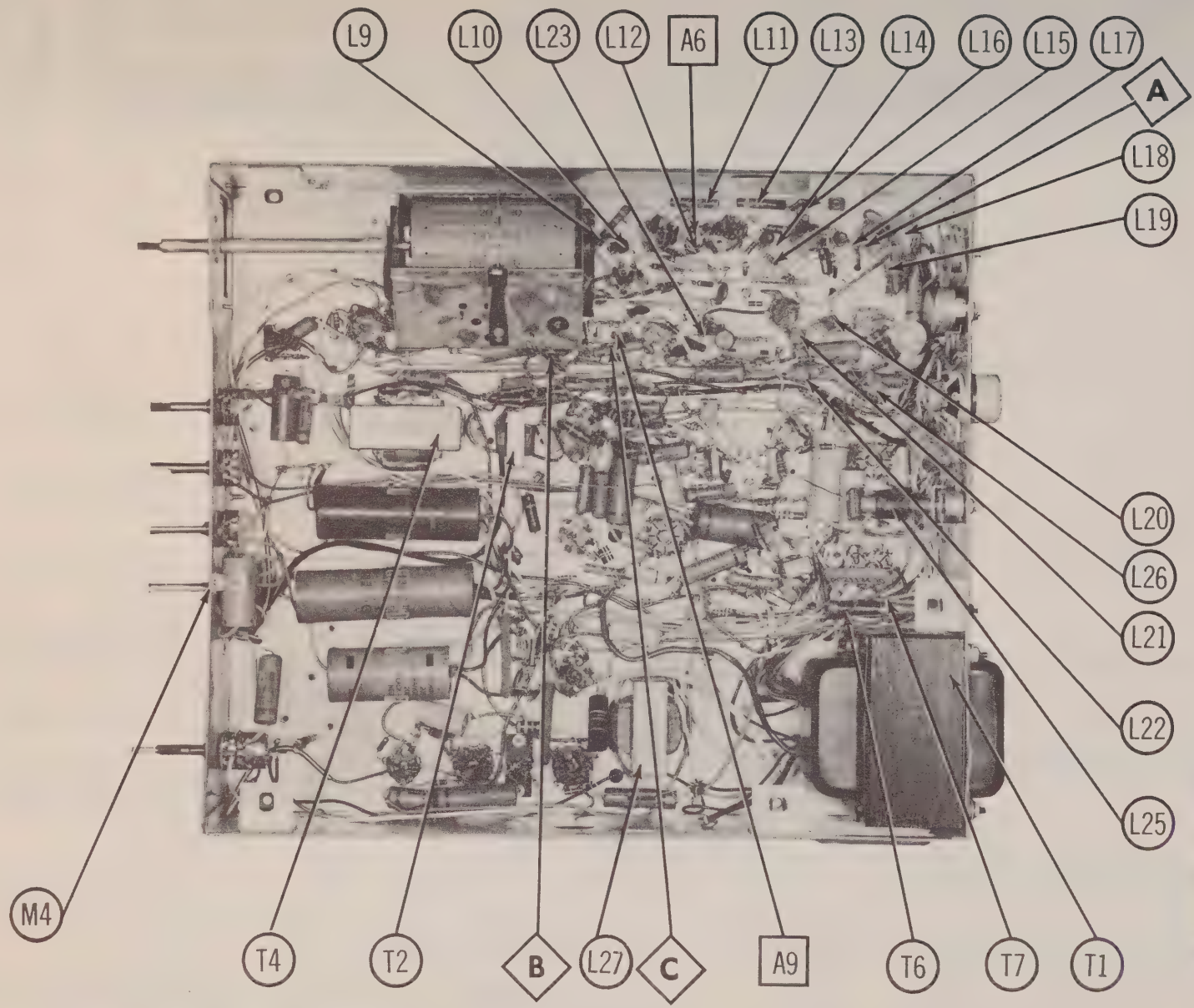
If Satisfactory	If Unsatisfactory
Check Ratio detector and audio IF alignment and components.	Check components associated with V13 and V14.

BUZZ

Adjust A10 for minimum buzz. If buzz is still objectionable substitute V12 and readjust A10 and A9. Check C9 and C57.

DISTORTED

Follow procedure outlined under "Weak or No Sound".



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
- F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No	USE	REPLACEMENT DATA: CBS Columbia PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6B27	6B27	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd Video IF Amp.	6AU6	6AU6	7BK	
V6	4th Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Amp.	6AU6	6AU6	7BK	
V8	Video Output	6AQ5	6AQ5	7BZ	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	Sound IF Amp. sp.	6AU6	6AU6	7BK	
V11	Limiter sp.	6AU6	6AU6	7BK	
V12	Ratio Detector	6AL5	6AL5	6BT	
V13	AF Amplifier	6AV6	6AV6	7BT	
V14	Audio Output	6V6GT	6V6GT	7S	
V15	Vert. & Horiz. Sync Separator	12BZ7	12BX7	9A	
V16	Sync Phase Inv. - Vert. Oscillator	12BH7	12BH7	9A	
V17	Vert. Output	6AH4GT	6AH4GT	9EL	
V18	Horiz. AFC	6AL5	6AL5	6BT	
V19	Horiz. Mult	12BH7	12BH7	9A	
V20	Horiz. Output	6CD6G	6CD6G	5BT	
V21	Damper	6AX4GT	6AX4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	
V24	LV Rectifier	5Y3GT	5Y3GT	5T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: CBS-Columbia PART No	SYLVANIA Part No.	GENERAL ELECTRIC Part No.	WESTINGHOUSE Part No	RETMA BASE TYPE	NOTES
V25	21FP4A	21FP4A	21FP4A	21FP4A	12C	① Circuit changes necessary.
		21FP4 ①	21FP4 ①		12C	
		21FP4C			12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	CBS-Columbia PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	80	200	A20173	AFH3-26		CO20		FP331.3	TVL-3642	Brown Orange Yellow
B	120	200					GP1K-470	UC-5447	5GA-Q47	
C2A	40	450							503C-D1	Red
B	20	450	A20168	AFH4-18		DO17		3N541	TVL-4840	Blue
C	20	450		PRB450/10		BR1045		TC75	TVA-1705	Green
D	10	450								
C3A	80	450	A20169	AFH3-142		C109		FP375	TVA-1716	Red
B	100	50							TVA-1310	Yellow
C4	25	25		PRS25/25		BR252		TC26	TVA-1305	Note 1
C5	500	6	A20171	E26C204		BRH605		*TC610		Note 5
								TC610		
C6	100	12	A30141	PRS12/100		BRH121		TC5201	TVA-1130	
C7	1	50	A20138	E26E73		BRR-1-50T		TC31	TVA-1300	
C8	10	250	A20145	PRS350/10		BR1025		TC52	TVA-1504	
C9	4	50	A20143	PRS150/4		BR1550		TC50	TVA-1303	
C10	10	250	A20145	PRS350/10		BR1025		TC52	TVA-1504	
C11	3-9				829-10				503C-D1	
C12	800			EF-001	MFT-1000					
C13	3.6									
C14	47			BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C15	800			EF-001	MFT-1000				503C-D1	
C16	1000			BPD-001	DD-103	TM5D1	801-001	DC-521	5HK-D1	
C17	1.5			SI1.5NP0	TCZ-1.5		NP0K-IR5	DC-5215	5TCCD-V15	
C18	.5-3				829-3			CT565A		
C19	800			EF-001	MFT-1000				503C-D1	
C20	47			BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C21	.5-3				829-3			CT565A		
C22	10			SI10NP0	TCZ-10		NP0K-100	DC-5210	5TCC-Q1	
C23	5			SI5N750			N750K-050		5TCUB-V5	
C24	1000			BPD-001	DD-103	TM5D1	801-001	DC-521	5HK-D1	
C25	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C26	800			EF-001	MFT-1000				503C-D1	
C27	800			EF-001	MFT-1000				503C-D1	
C28	120			BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C29A	5000		A19183	BPD-2X005	DD2-502	TM5DD5	811-005	DC-525	5HK-2D47	
B	5000						811-005	DC-525		
C30	1500		A19148	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C31	100		A556-118-2	SI100	D6-101	TM5T5	GP1K-101	UC-531	5GA-T1	
C32	5000		A19109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C33	1500		A19148	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C34	100			1469-0001		SR5T1		MCB235	MB31	
C35	100		A556-118-2	SI100	D6-101	TM5T5	GP1K-101	UC-531	5GA-T1	
C36	5000		A19109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C37	1500		A19148	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C38	5000		A19109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C39	100		A556-118-2	SI100	D6-101	TM5T5	GP1K-101	UC-531	5GA-T1	
C40A	5000		A19183	BPD-2X005	DD2-502	TM5DD5	811-005	DC-525	5HK-2D47	
B	5000						811-005	DC-525		
C41	680		A190-143	1469-0007		SR5T7			MB-37	
C42	5000		A19109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C43	5000		A19109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C44	.05	600	A194-160	P688-05	DF-503	PTE68S		MCB235	MB-31	
C45	120	500	A190-125	1469-0001		SR5T1		MCB235	MB-45	
C46	47	500	A555-123	1469-00005		SR5Q5		MCB225	6TM-85	
C47	.05	600	A194-160	P688-05		PTE68S		PT612	6TM-85	
C48	.002	1000	A197-194	P1088-002		PTE18D2		PT512	MB-D3	
C49	1.0	100	A194-21					PT41	2TM-M1	
C50	1.01	600	A194-155	P688-01	D6-103	PTE68I	GP2-333-103	PT611	6TM-81	

Note 1. Some Models may use a 50MMF ⓑ 25V in this application.
Note 2. Some Models may use a 270MMF in this application (part #A190-153)
Note 3. Some Models may use a .001MFD in this application (part #A194-145)
Note 4. Some Models may use a 180MMF in this application (part #A190-129)
Note 5. This unit must be non-polarized
Note 6. Not used in all Models.
* Connect negative leads together and positive leads to original connections.

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	CBS-Columbia PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C51A	4000			BPD-2X004	DD2-402	TM5DD4	811-004	DC-524	5HK-2D4	
B	4000						811-004	DC-524		
C52	47	500	A555-123	1469-00005		5R5Q5		MCB235	MB-31	
C53	47		A555-113-2	SI47NP0	TCZ-47		NP0K-470	ZT-5447	5TCC-Q47	
C54	5000		A19109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C55	5000		A19109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C56	5000		A19109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C57	1500		A19148	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C58	1000		A555-136-2	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C59	510		A556-238							
C60	220		A55-123	1468-00025	D6-231	5W5T25	GP2K-221	UC-237	1FM-325	
C61	.05	600	A194-160	P688-05	DF-503	PTE68S		PT615	6TM-85	
C62	.05	600	A194-160	P688-05	DF-503	PTE68S		PT615	6TM-85	
C63	1	600	A19216	P688-1	DF-104	PTE68P1		PT601	6TM-P1	
C64	.02	500	A194-156	P688-02	DF-203	PTE68Z		PT612	6TM-82	
C65	390	500	A190-137	1469-0004		SR5T4		MCB243	MB-34	
C66	270	500	A190-133	1469-0003		5R5T3		MCB241	MB-33	
C67	.01	500	A194-155	P688-01	D6-103	PTE68I	GP2-333-103	PT611	6TM-81	
C68	.005	600	A194-151	P688-005	D6-502	PTE68D5	GP2-333-502	PT625	6TM-D5	
C69	.005	600	A194-151	P688-005	D6-502	PTE68D5	GP2-333-502	PT625	6TM-D5	
C70	.01	600	A194-155	P688-01	D6-103	PTE68I	GP2-333-103	PT611	6TM-81	
C71	4700	500	A192-163	1464-005		IDR5D5		MCB465	MB-25	
C72	.002	600	A194-155	P688-01	D6-103	PTE68I	GP2-333-103	PT611	6TM-81	
C73	.02	600	A194-156	P688-02	DF-203	PTE68Z		PT612	6TM-82	
C74	.025	600	A194-157	P688-025		PTE68Z5		PT6125	6TM-825	
C75	.1	600	A194-162	P688-1	DF-104	PTE68P1		PT601	6TM-P1	
C76	.01	1000	A194-155	P1088-01		PTE18I		PT611	MB-D2	
C77	.02	600	A194-156	P688-02	DF-203	PTE68Z		PT612	6TM-82	
C78	22	500	A19220							
C79	.1	600	A194-162	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C80	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C81	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C82	.005	600	A197-151	P688-005	D6-502	PTE68D5	GP2-333-502	PT625	6TM-D5	
C83	.003	600	A197-148	P688-003	D6-302	PTE68D3	GP2-333-302	PT623	6TM-D3	
C84	.05	600	A197-160	P688-05	DF-503	PTE68S		PT615	6TM-85	
C85	470	500	A190-139	1469-0005		5R5T5		MCB245	MB-35	
C86	470	500	A190-139	1469-0005		5R5T5		MCB245	MB-35	
C87	3900	500	A195-261	1464-004		IDR5D4		MCB463	MB-24	Note 2
C88	220	2500								Note 3
C89	.005	600	A197-151	P688-005	D6-502	PTE68D5	GP2-333-502	PT625	6TM-D5	Note 4
C90	270	500	A190-133	1473-0003		5R5T3		MCB241	MB-33	
C91	.2	200	A19156	P288-2		PTE6P2		PT602	6TM-P2	
C92	.047	600	A197-160	P688-047	DF-503	PTE68S		PT615	6TM-847	
C93	.02	600	A194-156	P688-02	DF-203	PTE68Z		PT612	6TM-82	
C94	.047	600	A197-160	P688-047		PTE6S47		PT6147	6TM-847	
C95	560									
C96	500	20000	A19175-3	HV20C	TV3-502	MMC-20T5	413-501	HV20035A	20DK-T5	
C97	.1	600	A194-162	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C98	.01	600		689ZX-01		PTE6I		PT611	6TM-81	
C99	.01	600		689ZX-01		PTE6I		PT611	6TM-81	
C100	5000		A19109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C101	5000		A19109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	Note 6
C102	5000		A19102	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	Note 6

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	CBS-Columbia PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5000Ω	½	PA-24136	* QJ-423	RTV-393		UF53R	Contrast - Panel
B	250KΩ	½	Not Req.				UR254A †	Volume - Rear
C	Switch		Not Req.				US-28	Attach to R1B
R2A	100KΩ	½	PA-24134	Q11-126	AG-49-S	B-40	U-41	Brightness
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	5000Ω	½	PA-24137	Q11-114	AG-19-S	B-10	U-34	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A
R4A	2Meg	½	PA-24146	Q11-139	AG-83-S	B-75	U-56	Vert. Hold
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R4A
R5A	1Meg	½	PA-24113-C	Q11-137	AG-81-S	AB-69	SU-54	Focus
B	Shaft		Not Req.	Not Req.	RS-3	AK-1	Not Req.	Attach to R5A
R6A	5Meg	½	PA-24111-D	Q11-141	AG-85-S	AB-87	SU-67	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6
R7	20Ω	2	PA-24118	W20X10	RTV-98		R20CT	Vert. centering tapped at 10Ω
R8A	5000Ω	2	PA-24135	WK-5000	A43-5000	VK-135	R5005L	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R8A
R9A	100	2	PA-24116	W-100	A43-100		R100L	Horiz. Centering
B	Shaft		Not Req.	Not Req.	FKS-1/4		Not Req.	Attach to R9A
R10A	250KΩ	½	PA24138	Q11-130	AG-55-S	AB-50	SU-46	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK 1	Not Req.	Attach to R10A

* CONCENTRIKIT EQUIVALENT KIT K2 BASE ELEMENTS 4 SHAFTS B17-114 & P1-118 (Panel)
B13 150 & R2-305 (Rear) & SWT-18 T6-1.
† Universal replacement (Mallory exact duplicate Part No. US508S)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	CBS-Columbia PART No.	IRC PART No.	NOTES
R11	15KΩ			BTS-15K	
R12	47KΩ			BTS-47K	
R13	100KΩ			BTS-100K	
R14	160KΩ			BTS-160K	
R15	100KΩ			BTS-100K	
R16	150Ω			BTS-150Ω	
R17	10KΩ			BTS-10K	
R18	220KΩ			BTS-220K	
R19	10KΩ			BTS-10K	
R20	15KΩ			BTS-15K	
R21	4700Ω		A231-1165	BTS-4700	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	CBS-Columbia PART No.	IRC PART No.	NOTES
R22	82Ω		A231-1123	BTS-82	
R23	330Ω		A231-1137	BTS-330	
R24	330Ω		A231-1137	BTS-330	
R25	330Ω		A231-1137	BTS-330	
R26	8200Ω		A231-1171	BTS-8200	
R27	82Ω		A231-1123	BTS-82	
R28	15KΩ		A231-1177	BTS-15K	
R29	330Ω		A231-1137	BTS-330	
R30	4700Ω		A231-1165	BTS-4700	
R31	82Ω		A231-1123	BTS-82	
R32	6800Ω		A231-1169	BTS-6800	
R33	330Ω	1	A231-1137	BTS-330	
R34	220Ω	1	A231-1133	BTS-220	
R35	10KΩ	1	A231-1173	BTS-10K	
R36	330Ω	1	A231-1137	BTS-330	
R37	10KΩ	1	A231-1173	BTS-10K	
R38	1000Ω	1	A231-1149	BTS-1000	
R39	2700Ω	2	A233-1159	BTB-2700	
R40	470KΩ	1	A231-1213	BTS-470K	
R41	120Ω	1	A231-1127	BTS-120	
R42	270Ω	1	A232-1135	BTA-270	
R43	3300Ω	1	A231-1181	BTS-3300	
R44	4700Ω	1	A231-1165	BTS-4700	
R45	6800Ω	2		BTB-6800	
R46	10KΩ	2		BTB-10K	
R47	4700Ω	2	A233-1165	BTB-4700	
R48	4700Ω	2	A233-1165	BTB-4700	
R49	220KΩ		A231-1205	BTS-220K	
R50	1Meg			BTS-1Meg	
R51	5600Ω	1	A232-1167	BTA-5600	
R52	33KΩ	1	A231-1185	BTS-33K	
R53	12KΩ	1	A231-1177	BTS-12K	
R54	82KΩ	1	A231-1195	BTS-82K	
R55	2700Ω	1	A231-1159	BTS-2700	
R56	56KΩ	1	A231-1191	BTS-56K	
R57	82Ω	1	A231-1123	BTS-82	
R58	8200Ω	1	A232-1171	BTA-8200	
R59	100KΩ	1	A231-1197	BTS-100K	
R60	100KΩ	1	A231-1197	BTS-100K	
R61	2700Ω	1	A231-1159	BTS-2700	
R62	39KΩ	1	A231-1187	BTS-39K	
R63	560KΩ	1	A231-1215	BTS-560K	
R64	33KΩ	1	A231-1185	BTS-33K	
R65	82Ω			BTS-820	Note 1
R66	5600Ω			BTS-5600	Note 2
R67	220KΩ		A231-1205	BTS-220K	
R68	1500Ω	10	A21134-12	1 5/4A-1500	
R69	470KΩ	1	A231-1213	BTS-470K	
R70	330Ω	1	A232-1137	BTA-330	
R71	47Ω	1	A231-1117	BTS-47	
R72	470KΩ	1	A231-1213	BTS-470K	
R73	2.3Meg	1	A231-1229	BTS-2.2Meg	
R74	22KΩ	1	A231-1181	BTS-22K	
R75	2.7Meg	1	A231-1231	BTS-2.7Meg	
R76	8200Ω	1	A231-1171	BTS-8200	
R77	2700Ω	1	A232-1159	BTA-2700	
R78	1Meg	1	A231-1221	BTS-1Meg	
R79	22KΩ	1	A231-1181	BTS-22K	
R80	3300Ω	1		BTA-3300	
R81	2700Ω	1	A232-1159	BTA-2700	
R82	22KΩ	1	A231-1181	BTS-22K	
R83	8200Ω	1	A231-1171	BTS-8200	
R84	8200Ω	1	A231-1171	BTS-8200	
R85	1.5Meg	1	A232-1225	BTA-1.5Meg	
R86	100KΩ	1	A231-1197	BTS-100K	
R87	15KΩ	1	A231-1177	BTS-15K	
R88	2.2Meg	1	A231-1229	BTS-2.2Meg	
R89	1500Ω	1	A232-1153	BTA-1500	
R90	560Ω	1		BTS-560	
R91	560Ω	1		BTS-560	
R92	33KΩ	1	A232-1185	BTA-33K	
R93	33KΩ	1	A232-1185	BTA-33K	
R94	8200Ω	1	A231-1171	BTS-8200	
R95	27KΩ	1	A231-1207	BTS-27K	
R96	33KΩ	1	A232-1185	BTA-33K	
R97	100KΩ	1	A231-1197	BTS-100K	
R98	100KΩ	1	A231-1197	BTS-100K	
R99	5.3Meg	1	A231-1233	BTS-5.3Meg	
R100	470KΩ	1	A231-1213	BTS-470K	
R101	2200Ω	1	A231-1157	BTS-2200	
R102	6800Ω	1	A231-1169	BTS-6800	
R103	100KΩ	1	A231-1197	BTS-100K	
R104	150KΩ	1	A231-1201	BTS-150K	
R105	470KΩ	1	A231-1213	BTS-470K	
R106	330KΩ	1	A231-1209	BTS-330K	
R107	82Ω	1	A231-1123	BTS-82	
R108	150Ω	2	A233-1129		
R109	82Ω	1	A231-1123	BTS-82	
R110	39KΩ	2		BTS-39K	
R111	4700Ω	1	A231-1165	BTS-4700	
R112	500Ω	5	A23134-10	1 3/4A-500	
R113	1.2Meg	1	A231-1223	BTS-1.2Meg	
R114	330KΩ	2	A233-1209	BTB-330K	
R115	330KΩ	2	A233-1209	BTB-330K	
R116	8.2Ω	1	A23158		
R117	300Ω	7	A23134-11	1 3/4A-300	
R118	1.2Ω	1	A23151		
R119	1.2Ω	1	A23151		
R120	220KΩ	1			
R121	470KΩ	1		BTS-470K	
R122	33KΩ	1		BTS-33K	

Note 1. Some models may use a 3300Ω resistor in this application.
Note 2. Some models may use a 18KΩ resistor in this application.
Note 3. Some models may use a 15KΩ 5 watt resistor in this application,

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	CBS-Columbia PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	RCA TYPE No
T1	117VAC ⓐ 2A	626VCT .180ADC	5VAC ⓐ 3A	5VAC ⓐ 2A tap ④	PC-10148					
		380VCT .060ADC		6.3VAC ⓐ 1.2A						

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	CBS-Columbia PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No	NOTES
T2	176Ω	1000Ω	PB-10106-2	A-8125	A-3003	TBO-5	A-97X	209T1 ②	Vert.Osc. Trans. Horiz.Output Trans.
T3	380Ω tap ⓐ 30Ω	10.2Ω tap ⓐ 3.7Ω	PC-10147						
		SEC. 2 1.2Ω tap ⑤ .2Ω	PC-10161 ①						
		SEC.3 0Ω							
T4	960Ω	8Ω	PC-10154-2	A-8112 ②	A-3038	TSO-8	A-98X		Vert.Output Trans. Horiz.Deflection Coils
T5A	11.5Ω		PC-28317-1	DY-8A ③	MDF-70 ③	TY-2 ④	Y-12	208D1 ④	Vert.Deflection Coils
B	56Ω								
T6	2Ω		PB-28318 PA-28216 ⑤	WC-2 ⑥	MWC-2 ⑦	TW-5	WC-12 ⑧	206R1	Horiz.Lin.Coil
T7	2Ω		PB-28318	WC-2 ⑥	MWC-2 ⑦	TW-5	WC-12 ⑧	206R1	Width Coil

① Alternate horizontal output trans.
② Drill one new mounting hole.
③ Use original horizontal deflection coil network if necessary.
④ Use original deflection coil network.
⑤ Alternate horizontal linearity coil
⑥ Do not use tap.
⑦ Enlarge mounting hole.
⑧ Connect to coded green and red terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES PRI.	RATING DC RES SEC.	CBS-Columbia PART No	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	NOTES
T8	5.6KΩ	1.8Ω	320Ω	.56Ω		A-3877	A-2930	RO-9	S-5X	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CBS-Columbia PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6"	PM	3. 6Ω	A-58132 ①	ST-108 Mod P6-X	6A21	① Audio output transformer is mounted on this speaker.
SP2	6"	PM	3. 6Ω	A-58133	ST-108 Mod. P6-X	6A21 6A21	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CBS-Columbia PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coils	0ΩCT	0Ω					
L2	Fil. Choke	0Ω						
L3	Neutr. Coil	0Ω						
L4	RF, Mixer grid and Osc. Coils	0Ω						
L5	Fil. Choke	0Ω						
L6	RF Choke	0Ω						
L7	1st Video IF	1. 1Ω						
L8	RF Choke	1. 1Ω						
L9	Fil. Choke	. 27Ω		PA28276	19-3001	TV-189	6175	. 82 Microhenry; IRC Part # CL-1
L10	2nd Video IF	. 2Ω		PB3392	17-1003	TV-102 †	6188 †	
L11	Fil. Choke	. 27Ω		PA28276	19-3001	TV-189	6175	. 82 Microhenry; IRC Part # CL-1
L12	3rd Video IF	. 2Ω		PB28320			6246	Includes trap
L13	Fil. Choke	. 27Ω		PA28276	19-3001	TV-189	6175	. 82 Microhenry; IRC Part # CL-1
L14	4th Video IF	. 2Ω		PB3392	17-1003	TV-102 †	6188 †	
L15	RF Choke	2. 5Ω		PA28253			4626	21 Microhenries
L16	Fil. Choke	. 27Ω		PA28276	19-3001	TV-189	6175	. 82 Microhenries; IRC Part # CL-1
L17	5th Video IF	. 2Ω		PB3392				
L18	Series Peak. Coil	9Ω		PC28255-2	19-3180	TV-184	6154	194 Microhenries
L19	Shunt. Peak. Coil	13Ω		PC28255-8	19-3300	TV-185	6155	303 Microhenries
L20	4. 5MC Trap	1. 7Ω		PA28286	20-1004	TV-151	1470	
L21	Series Peak. Coil	5Ω		PC28255-1	19-3125	TV-181	4644	130 Microhenries
L22	Shunt Peak. Coil	9. 5Ω		PC28255-11	19-3180	TV-184	6154	209 Microhenries
L23	Sound IF	1. 7Ω		PA28286	17-3400	TV-151	1469	
L24	Ratio Det.	5. 5Ω	1. 8ΩCT	PB1201 *	17-3497	TV-115	6205	Tertiary winding=. 6Ω
L25	Horiz. Osc.	48Ω		PA28263	19-1576	TV-163	6210	
L26	Shunt Peaking Coil	5Ω		PC28255-1	19-3125	TV-181	4644	130 Microhenries

* Alternate Part # PB1202
† Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	CBS-Columbia PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L27	. 180A	71Ω	1. 8HY	PB1414	C-2325 ①	C-2991 ①	TR-1733 ①	C-21X ①

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			CBS-Columbia PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG P/T S/B	. 8A			313. 800 (3AG-. 8A) P/T S/B		MDV 8/10	

MISCELLANEOUS

ITEM No.	PART NAME	CBS-Columbia PART No.	NOTES
M2	Tuner	PC-541215	
M3	Video Detector	PB-28321	Assembly - includes 1N60 Crystal
M4	Switch	PA-37111	Local-DX-Phono (rotary wafer)
M5	Ion Trap		
M6	Correction Magnet		(2) used
	Cabinet	A-60209	
	Knob	A-39239-3	Picture
	Knob	A-39240-3	Fine tuning
	Knob	A-39241-2	Off/On/Volume
	Knob	A-39242-2	Channel Selector
	Knob	A-39246-1	Auxiliary (3 used), brightness, horiz. & vert. hold
	Knob	A-39247-2	Local-DX-Phono
	Back Cover	A-62420	
	Glass, safety	A-62457-13	
	Mask	A-62418	
	Strip	A-62410-2	Glass retainer, upper
	Strip	A-62412-2	Glass retainer, lower

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If filaments light, check V23 and V24 by substitution. Check B+ filter and decoupling components.

SMALL AND / OR DIM PIX

Substitute V23 and V24. Check B+ filter and decoupling components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V19, V20, V21 and V22. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check C96, R116, T3, T5A and other associated circuit components.	Check C88, C89, C90 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, V21, V22 and V23. Check picture tube. See "Loss of High Voltage".

BLOOMING

Check by substitution V19, V20, V21, V22 and V23. Check C96, R116, T3, T5A, picture tube and other associated circuit components.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5 and V6. Check video detector crystal and assembly. Check components associated with the video IF strip.

NO RASTER NO SOUND

See "Dead Set".

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

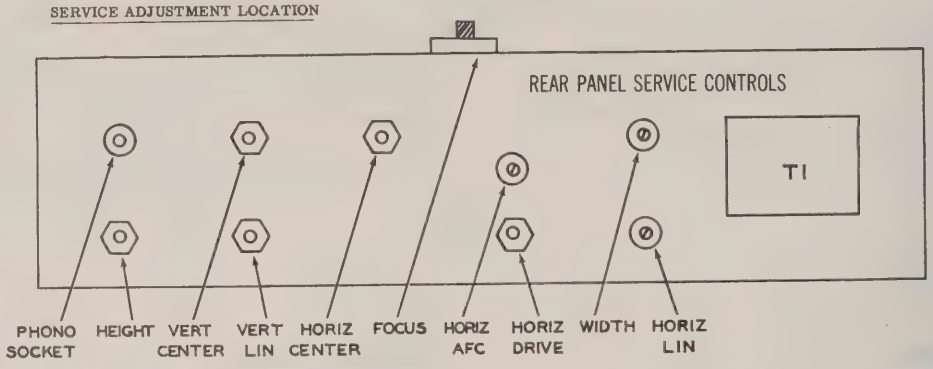
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions.).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the Horiz. Hold Control at the Mid-position of its range and adjust the Horiz. AFC slug L25 until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L24 located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for L. V. Power Supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished electrically. Adjust the vert. and horiz. centering controls located on rear panel until picture is properly centered.

ANTI-PIN CUSHION ADJUSTMENT

Reduce the picture size so that the sides of the raster are visible, and position the magnets so that all sides are straight lines and corners are at right angles.

DISASSEMBLY INSTRUCTIONS

1- Remove 8 push on type control knobs from front panel.

2- Disconnect built-in antenna and transmission line from rear cover.

3- Remove 15 wood and 1 metal screws. Remove rear cover.

4- Disconnect 2 speaker (in series).

5- Remove 4 chassis bolts. Remove chassis.

6- Remove 4 speaker nuts (applies to both speakers). Remove speakers .

7- Remove speaker ground from chassis. (1 screw)

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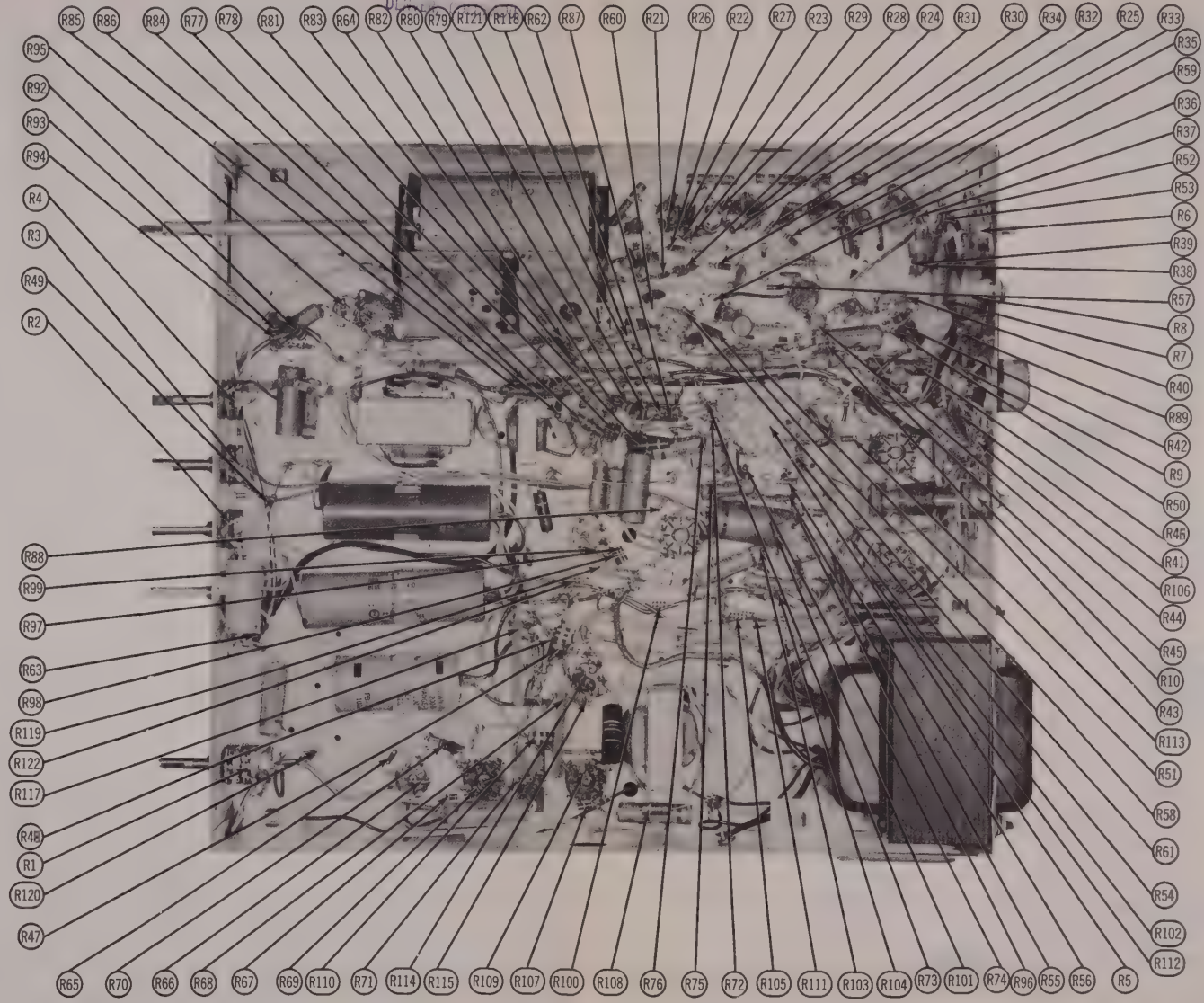
3924 MEADE ST
DE[illegible]



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

FIRESTONE MODELS 13-G-128, 13-G-129, 13-G-130, 13-G-132, 13-G-145, 13-G-146

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DENVER, COLORADO

FIRESTONE MODELS 13-G-128, 13-G-129, 13-G-130, 13-G-132, 13-G-145, 13-G-146

MODEL 13-G-128

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DATE 2-54 SET 230 FOLDER 6

PHOTOFACT* Folder
*TRADE MARK

FIRESTONE MODELS 13-G-128, 13-G-129, 13-G-130, 13-G-132, 13-G-145, 13-G-146

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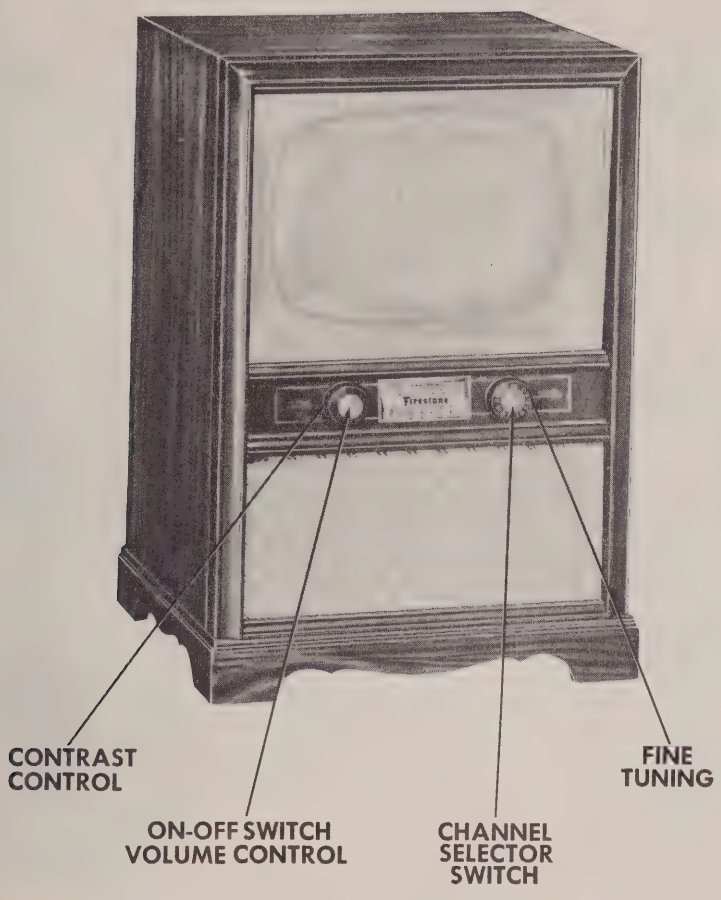

FIRESTONE MODEL 13-G-128

TRADE NAME	Firestone Models 13-G-128, 13-G-129, 13-G-130, 13-G-132, 13-G-145, 13-G-146
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	Television Receiver
TUBES	Twenty-five
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2 Amp. @ 117 Volts AC
TUNING RANGE-	Channels 2 thru 13 VHF, 14 thru 83UHF, Video IF 26.2MC, Sound IF 21.7MC (Intercarrier)

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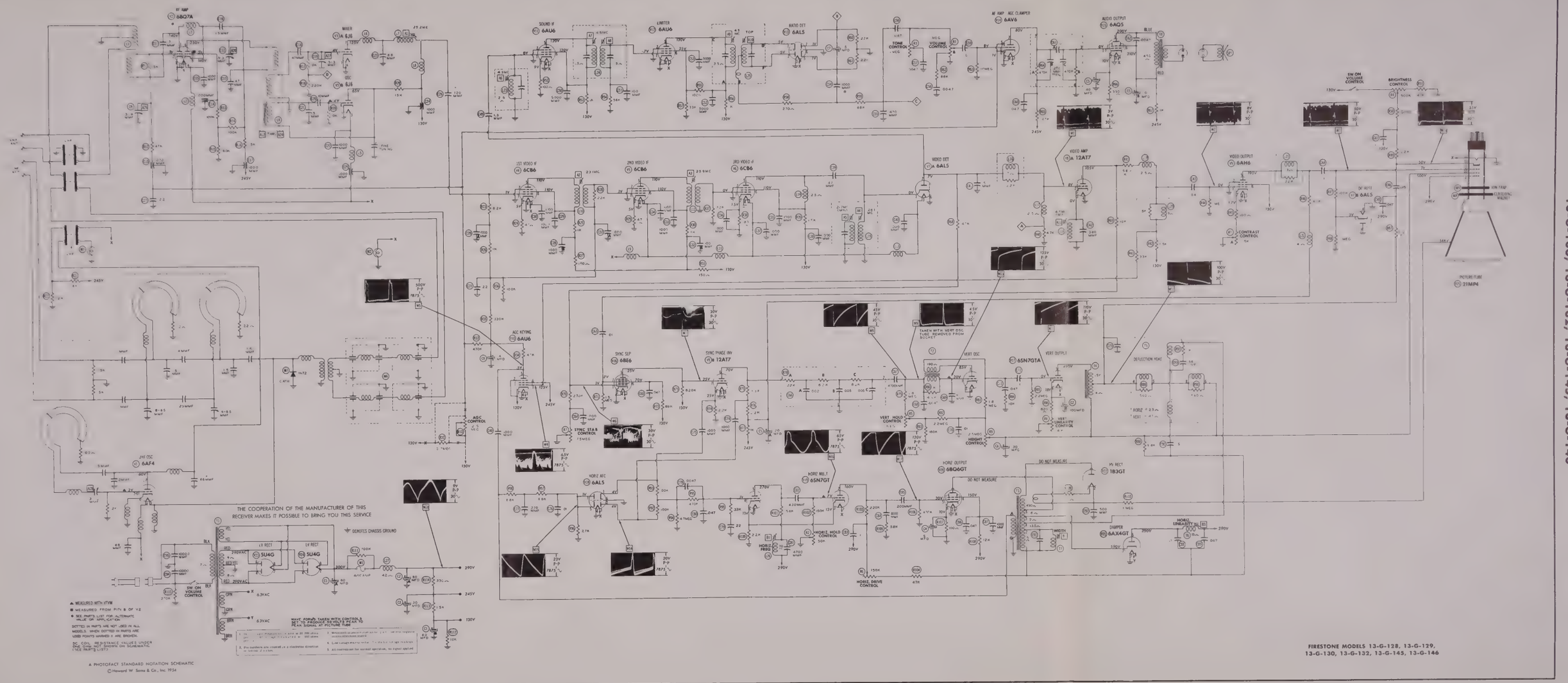
DATE 2-54 SET 230 FOLDER 6

FIRESTONE MODELS 13-G-128, 13-G-129, 13-G-130, 13-G-132, 13-G-145, 13-G-146



FIRESTONE MODELS 13-G-128, 13-G-129, 13-G-130, 13-G-132, 13-G-145, 13-G-146

FIRESTONE MODELS 13-G-128, 13-G-129, 13-G-130, 13-G-132, 13-G-145, 13-G-146

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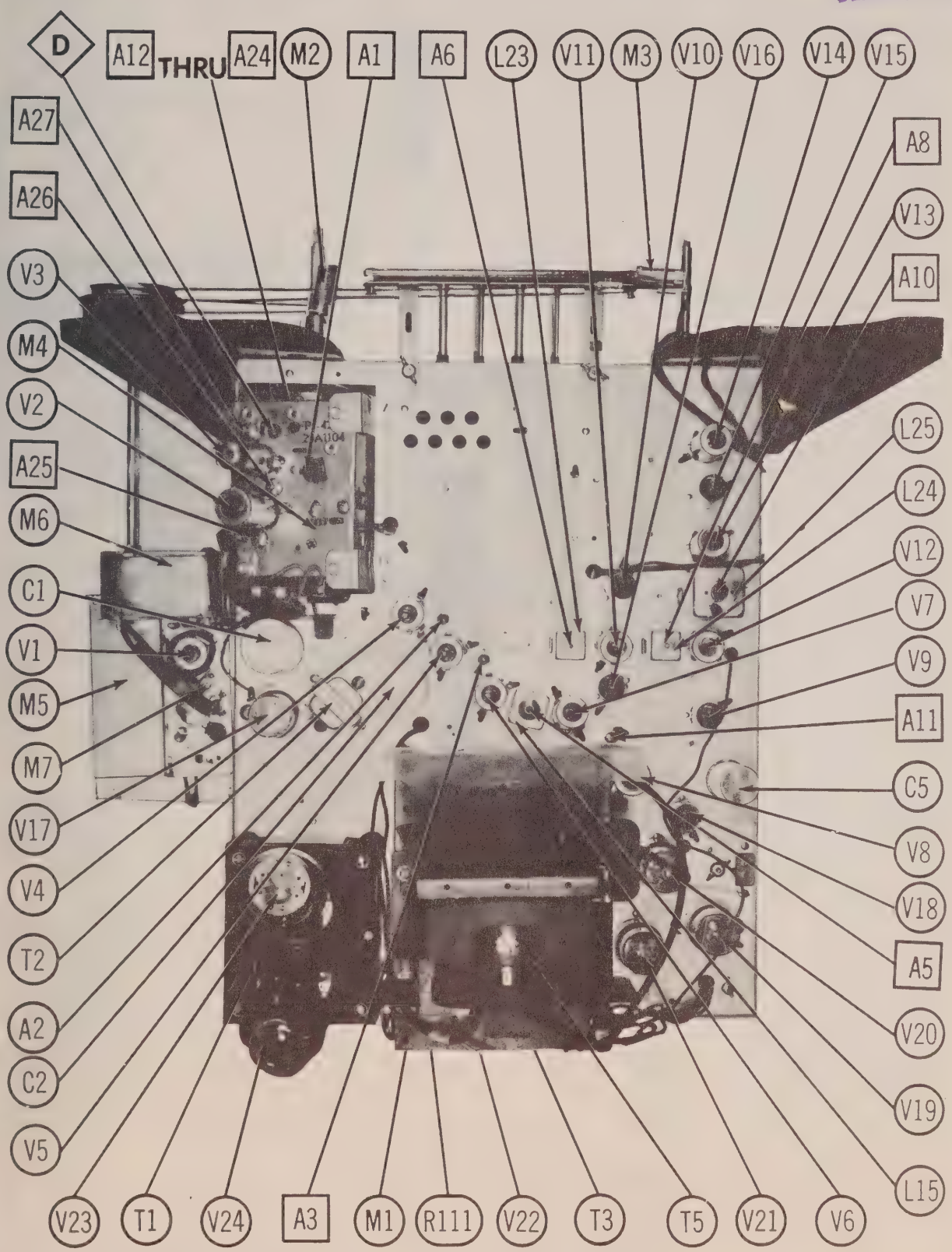

CHASSIS TOP VIEW

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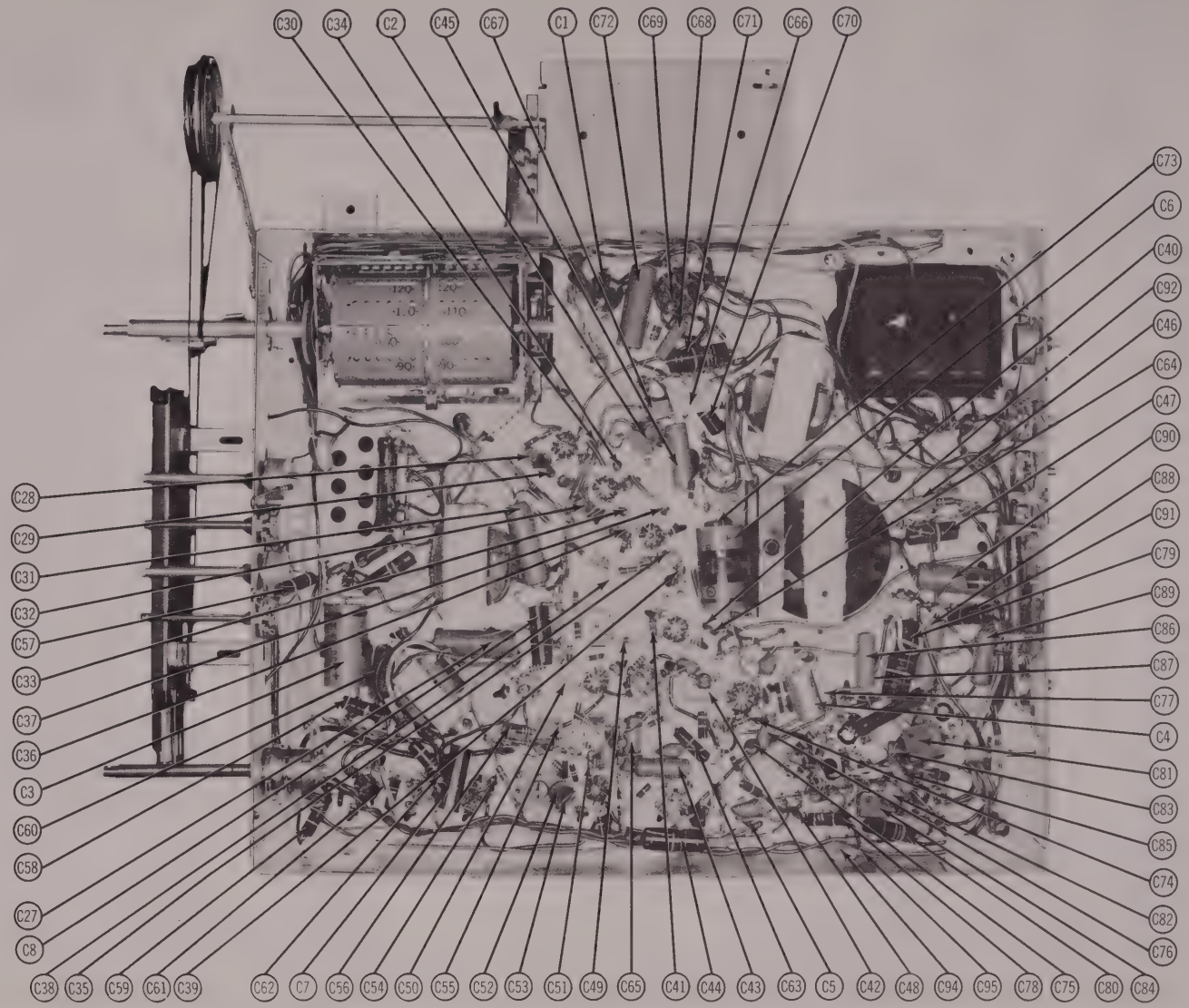

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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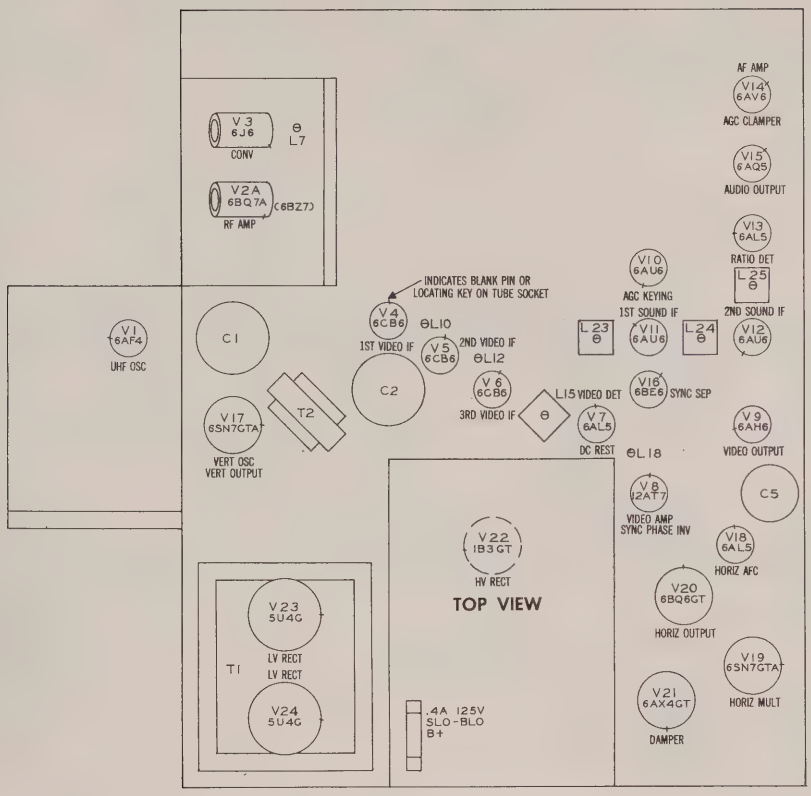

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V23, V24, Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V8, V9, V25**
Has pic, no sound - **V11, V12, V13, V14, V15**
Overloaded picture - **V10, V14**

SYNC FAILURE
No vert. sync - **V8, V17**
No horiz. sync - **V8, V18, V19**
No vert. or horiz. sync - **V8, V16**

SWEEP FAILURE
No raster, has sound - **V18, V20, V21, V22, V25**
No vertical deflection - **V17**
Poor vert. linearity or foldover - **V17**
Poor horiz. linearity or foldover - **V19, V20, V21**
Narrow picture - **V19, V20, V21, V22, V23, V24**
Vert. off freq. - **V8, V17**
Horiz. off freq. - **V8, V18, V19**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, V19.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 4.5Volt bias supply to the ungrounded side of C31. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.2MC (Unmod.)	Any	DC probe thru decoupling filter (Fig.1) to point A . Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	23.1MC	"	"	A2	"
3.	"	"	25.9MC	"	"	A3	"
4.	"	"	24.1MC	"	"	A4	"
5.	"	"	21.7MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.7MC 23.0MC 23.5MC 25.25MC 26.2MC	Any	Vert. Amp. thru decoupling filter (Fig. 1) to point A Low side to chassis.		Check for response curve similar to Fig.3. If necessary retouch A1 thru A4 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (cathode) of 6AL5 (V7A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point B . Common to chassis.	A6, A7, A8, A9	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point C . Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (cathode) of 6AL5 (V7A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru decoupler (Fig.1) to point B . Low side to chassis.	A6, A7, A8, A9	Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitide and symmetry as in Fig. 3.
8.	"	"	"	"	"	Vert. Amp. thru decoupler (Fig.1) to point C . Low side to chassis.	A10	Reconnect stabilizer capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Turn contrast control to maximum clockwise position.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to pin 7 of 6AL5 (V7A). Low side to chassis.	Not used	4.5MC (400∿Mod)	Any	Vert. amp. thru decoupler (Fig.1) to pin 2 of picture tube. Low side to chassis.	A 11	Adjust for minimum 400∿ indication on scope

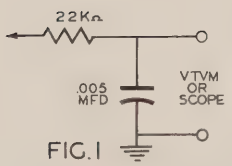

FIG.1

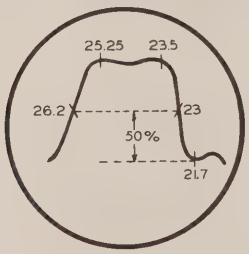

FIG.2

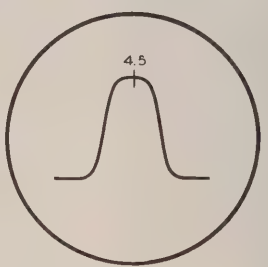

FIG. 3

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ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The oscillator adjustment screws for each channel are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru decoupler (Fig.1) to point A . Low side to chassis.	A12	Adjust to place sound marker in notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	
11.	"	Across output of UHF tuner	124MC (10MC Swp)	121.75MC 126.25MC	UHF		A24	

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru decoupler (Fig.1) to point D . Low side to chassis.	A25, A26 A27	Adjust for response curve similar to Fig.6. with markers above 90%.
13.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig.6. If markers fall below 70% on any channel make slight compromise adjustment of A24, A25, and A26 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.75MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			
			124MC (10MC Swp)	121.75MC 126.25MC	UHF			

UHF TUNER ALIGNMENT

Due to circuit complexity of the UHF tuner, alignment in the field should not be attempted.
Service should also be limited to the replacement of oscillator tube (V3) and crystal 1N72/1N82.
If either crystal or oscillator is replaced adjustment of the UHF oscillator trimmer, A28, maybe necessary. If necessary, adjust A28 for tuner range of below 470MC to above 890MC.
If the UHF tuner does not operate properly after tube or crystal replacement and adjustment of A28 the tuner should be returned to the factory.

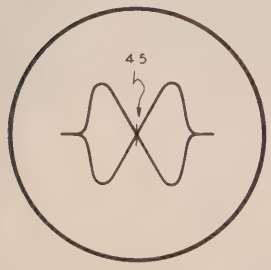


FIG. 4

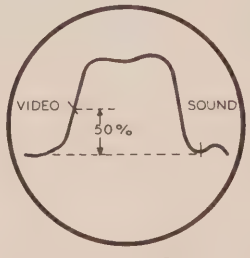


FIG.5

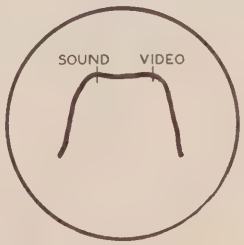
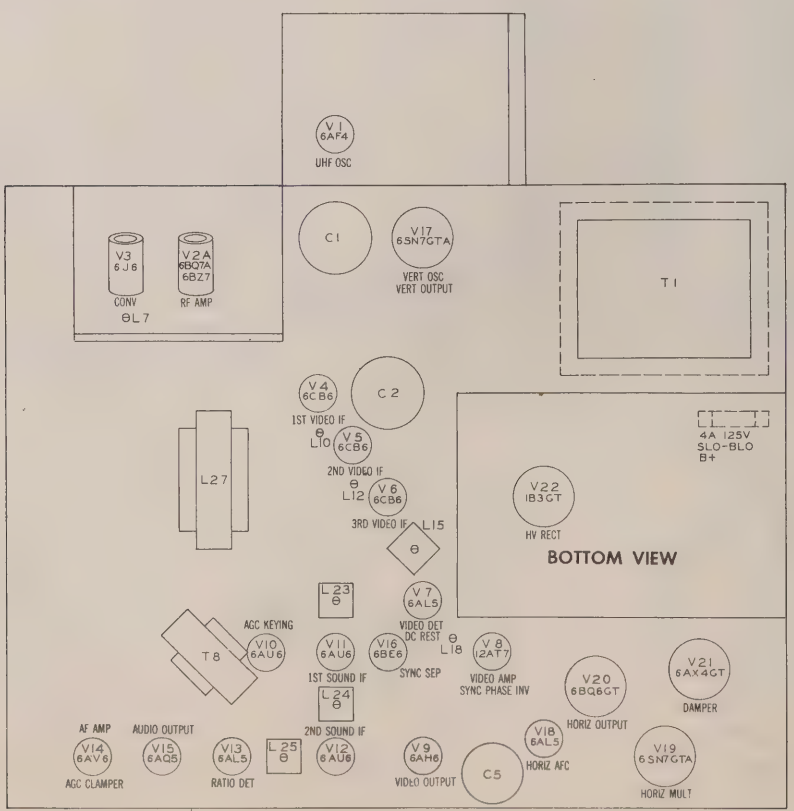


FIG.6

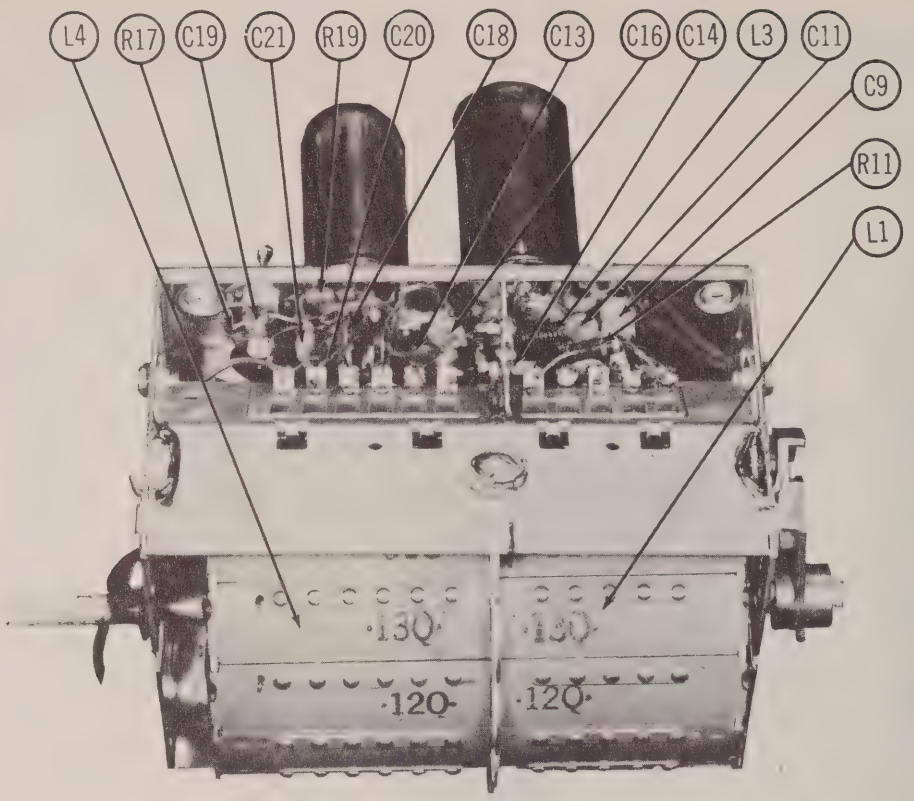
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	■6KΩ	12KΩ	.1Ω	.2Ω	.1Ω	12KΩ	■6KΩ		
V 2	6BQ7A	INF	680KΩ	0Ω	.1Ω	0Ω	■2KΩ	160KΩ	INF	0Ω
V 3	6J6	17KΩ	■2KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 4	6CB6	110KΩ	47Ω	.1Ω	0Ω	■2.8KΩ	■2.8KΩ	0Ω		
V 5	6CB6	100KΩ	47Ω	.1Ω	0Ω	■2.8KΩ	■2.8KΩ	0Ω		
V 6	6CB6	.3Ω	180Ω	.1Ω	0Ω	■3KΩ	■3KΩ	0Ω		
V 7	6AL5	.7Ω	0Ω	.1Ω	0Ω	1Meg	0Ω	4.7KΩ		
V 8	12AT7	■8.5KΩ	4.7KΩ	.2Ω	0Ω	0Ω	■7.5KΩ	■820KΩ	2.2KΩ	.1Ω
V 9	6AH6	1Meg	0Ω	.1Ω	0Ω	■6.2KΩ	■1.8KΩ	500Ω		
V 10	6AU6	■36.5K	■1.8KΩ	.1Ω	0Ω	470KΩ	■400Ω	■1.8KΩ		
V 11	6AU6	.1Ω	0Ω	.1Ω	0Ω	■2.6KΩ	■2.6KΩ	100Ω		
V 12	6AU6	56KΩ	0Ω	.1Ω	0Ω	■2.6KΩ	■24KΩ	0Ω		
V 13	6AL5	INF	INF	0Ω	.1Ω	32KΩ	INF	22KΩ		
V 14	6AV6	10Meg	0Ω	.1Ω	0Ω	680KΩ	680KΩ	■520KΩ		
V 15	6AQ5	470KΩ	330Ω	0Ω	.1Ω	■1.7KΩ	■1.3KΩ	470KΩ		
V 16	6BE6	40KΩ	0Ω	.1Ω	0Ω	■820KΩ	■70KΩ	1.5Meg		
V 17	6SN7GT	2Meg	▲1.7Meg	0Ω	2.2Meg	▲7KΩ	2KΩ	.1Ω	0Ω	
V 18	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	9KΩ	INF	9KΩ		
V 19	6SN7GT	170KΩ	▲340KΩ	2.2KΩ	5Meg	■5.6KΩ	2.2KΩ	.1Ω	0Ω	
V 20	6BQ6GT	5.6KΩ	0Ω	INF	■12KΩ	470KΩ	420KΩ	.1Ω	100Ω	TOP CAP ▲16Ω
V 21	6AX4GT	6.3KΩ	INF	440KΩ	4.5Meg	■50Ω	6.3KΩ	0Ω	.1Ω	
V 22	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ▲446Ω
V 23	5U4G	INF	10KΩ	INF	18Ω	INF	19.5Ω	INF	10KΩ	
V 24	5U4G	INF	10KΩ	INF	18Ω	INF	19.5Ω	INF	10KΩ	
V 25	21MP4	0Ω	1.1Meg	PIN 6 ■50Ω	PIN 10 ▲6.8KΩ	PIN 11 ■180KΩ	PIN 12 .1Ω			

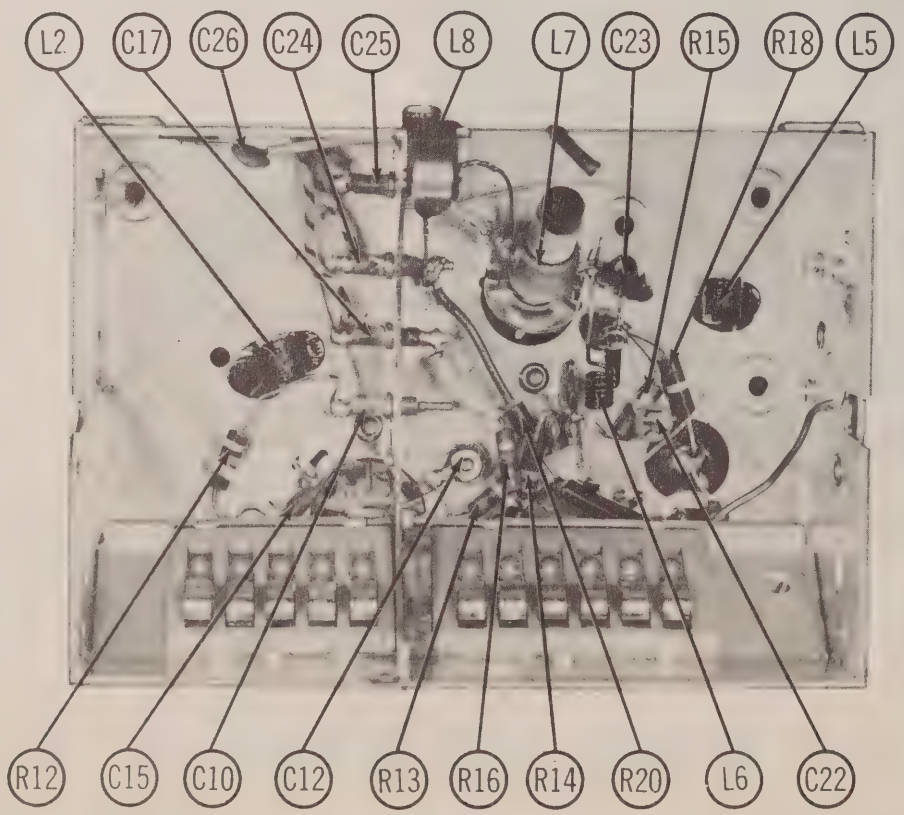
■MEASURED FROM PIN 2 OF V24.
▲MEASURED FROM PIN 3 OF V21.



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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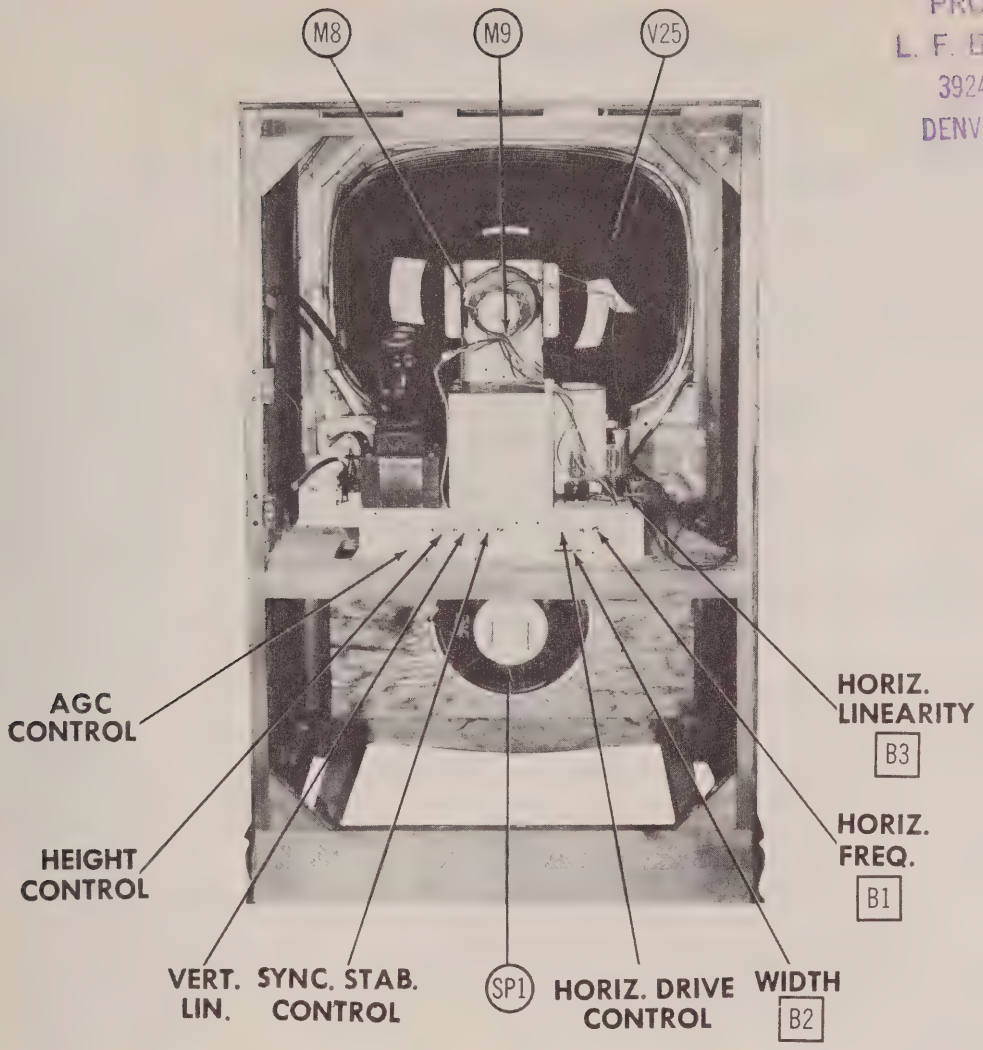


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until the picture falls into sync.

Adjust the horizontal drive control for the best compromeise between brightness and linearity.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V19, V20, V21, V23 and V24. Check adjustment of horiz. drive control, B2 and B3. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check C86, C87, C90, C91, T3, T5A, R108 and other associated components.	Check C82, C83, C84, C85, R103, R104, R106, R101, R100, R6 and other associated components.

DRIVE LINES

Check adjustment of horiz. drive control. Check by substitution V19, V20 and V21. Check C83, C84, C85, C88, C89, T3, T5A and other associated circuit components.

COMPRESSED LEFT SIDE

Check horiz. drive adjustment. Check adjustment of B2 and B3. Check by substitution V19, V20 and V21. Check T3, T5A, C86, C87 and other associated components.

FOLDS

Check by substitution V19, V20 and V21. Check T3, T5A and other associated components.

XMAS TREE EFFECT

Substitute V19. Check C81, C82 and other components associated with V19.

VERTICAL

LOSS OF SWEEP

Substitute V17. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check T4 and T5B.	Check C71, C72, C68, C69, R88, R81 and other associated components.

INSUFFICIENT SWEEP

Substitute V17. Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Substitute V17. Check R81, R9, C70, R85, C72 and other associated circuit components.

COMPRESSED AT TOP

Substitute V17. Check C2B, T4, T5B, R8 and other associated components.

FOLDS

Substitute V17. Check assoicated circuit components.

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V18 and V19. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check components associated with V18 and V19 especially R98, R97, R95 R99, C76, C77, C79 and C80.	Check C74, C75, R92 and R93.

CRITICAL HOLD

Check by substitution V18 and V19. Check adjustment of B1. Follow procedure outlined under "Loss of Sync".

HORIZONTAL BENDING OR S-ING

Check by substitution V19, V20, V16 and V8. Check adjustment of sync stability and AGC threshold controls. Check C1A and C2A.

VERTICAL

LOSS OF SYNC

Check by substitution V16, V8 and V17. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check components associated with V17 especially C68 and T2.	Check vert. integrator network C67, C63 and other components associated with V16 and V8.

CRITICAL HOLD

Substitute V17, V16 and V8. Check adjustment of sync stability and AGC threshold controls. Proceed as outlined under "Loss of Sync".

TRIGGERING

Check by substitution V17, V16 and V8. Check circuit near these stages for filament lead dress.

VIDEO

LOSS OF VIDEO

Check by substitution V7, V8 and V9. Check picture tube and other associated components especially coupling capacitors and plate load resistors.

SOUND BARS (4.5 MC BEAT)

Check alignment of local oscillator. Check adjustment of 4.5 MC trap (A11). Check video IF alignment.

NEGATIVE PIX

Check by substitution V7, V8, V9 and V10. Check setting of the AGC threshold control. Check picture tube and other associated circuit components.

POOR CONTRAST

Check by substitution V1, V4, V5, V6, V7, V8 and V9. Check associated circuit components. Check picture tube.

SMEAR

Check by substitution V7, V8 and V9. Check L16, L20 and L21. Check C41, C43 and C44. Check R41, R42, R44 and R46 for change of value. Check picture tube and other associated components.

WIDE BLACK BAR ACROSS PIX

Check tuner, video IF, video detector and video amplifier tubes for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12, V13, V14 and V15. Check stages of V14 and V15 using audio signed generator. Apply signal across R63.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V14 and V15 especially C61.

BUZZ

Realign audio IF and ratio detector following procedure outlined in the alignment section. If buzz is still objectionable substitute V13 and readjust A9 and A10. Check C54 and C7.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

PARTS LIST AND DESCRIPTIONS

PROPERTY OF
SERVICEMAN'S OWNERSHIP
1400 WEADE ST.
DENVER, COLORADO

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		FIRESTONE PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V3	Converter	6J6	6J6	7BF	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector-DC Restorer	6AL5	6AL5	6BT	
V8	Video Amplifier Sync Phase Inv.	12AT7	12AT7	9A	
V9	Video Output	6AH6	6AH6	7BK	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V12	Limiter	6AU6	6AU6	7BK	
V13	Ratio Detector	6AL5	6AL5	6BT	
V14	AF Amplifier-AGC Clamper	6AV6	6AV6	7BT	
V15	Audio Output	6AQ5	6AQ5	7BZ	
V16	Sync Separator	6BE6	6BE6	7CH	
V17	Vert. Oscillator - Vert. Output	6SN7GTA	6SN7GTA	8BD	
V18	Horiz. AFC	6AL5	6AL5	6BT	
V19	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V20	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V21	Damper	6AX4GT	6AX4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	
V24	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA				RETMA BASE TYPE	NOTES
	FIRESTONE PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.		
V25	21MP4	21MP4	21MP4	21MP4	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲80	400	45X390	AFH3-46		CO37		FP378	R1341	
B	▲60	400								
C2A	▲80	400	45X391	AFH3-142		C109		FP375	TVL-3764	
B	▲100	50								
C3	30	400	45X393	PRS450/30		BR3045A		TC77	TVA-1711	
C4	5	25	45X378	PRS150/4		BR550		TC30	TVA-1203	
C5A	■20	400	45X392	AFH3-137		CO97		FP366	TVL-3751	
B	▲10	400								
C	40	50								
C6	30	400	45X393	PRS450/30		BR3045A		TC77	TVA-1711	
C7	5	25	45X378	PRS150/4		BR550		TC30	TVA-1203	
C8	4	100	45X361	PRS150/4		BR415		TC40	TVA-1402	
C9	3-9		31B-207		829-10					
C10	1000		13D-153	EF-001	MFT-1000				503C-D1	
C11	3		CD8C3R6C	SI3NP0						
C12	.5-3		31B-206		829-3			CT565A		
C13	47		CD8Q470K	BPD-000047	D6-470		GP1K-470	UC-5447	5GA- Q47	
C14	1000		13D-196	EF-001	MFT-1000				503C-D1	
C15	1000		CD8X102Z	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C16	1.5		CD8C1R5M	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C17	1000		13D-153	EF-001	MFT-1000				503C-D1	
C18	47		CD8Q470K	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C19	.5-3		31B-206		829-3			CT565A		
C20	10		CD10C100K	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C21	5		CD8U050C	SI5N750	TCN-5		N750K-050		5TCUB-V5	
C22	1000		CD8X102Z	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C23	6.8		CD8C6R8C	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C24	1000		13D-153	EF-001	MFT-1000				503C-D1	
C25	1000		13D-153	EF-001	MFT-1000				503C-D1	
C26	120		13D-055	BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C27	.22	200	RCP10M2224M	P488-22		PTE4P22		PT4025	2TM-P22	
C28A	1000		80X3	BPD-2X001	DD2-102	TM5DD1	812-001	DCD-521	5HK-2D1	
B	1000									
C29	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C30	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C31	.22	200	RC10M2224M	P488-22		PTE4P22		PT 4025	2TM-P22	
C32A	1000		80X3	BPD-2X001	DD2-102	TM5DD1	812-001	DCD-521	5HK-2D1	
B	1000									
C33	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C34	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C35	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C36	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C37	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C38	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C39	47		47X603	SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C40	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C41	5		47X562	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C42	360	500	47X568							
C43	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C44	.1	400	RCP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C45	.047	600	RCP10M6473M	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C46	.015	600	RCP10M6153M	P688-015		PTE6S15		PT6115	6TM-S15	
C47	.1	200	RCP10M2104M	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C48	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C49	1.5		47X584	SIL.5NP0	TCZ-1.5		NPOK-1R5	ZT-5515	5TCCB-V15	
C50	5000		47X507	BPD-005	MD-502	TMSD6	811-005	DC-525	5HK-D5	
C51	100		47X504	BI00	D6-101	TMS7I	GPIK-101	UC-531	5GA-T1	
C52	5000		47X507	BPD-005	MD-502	TMSD6	811-006	DC-525	5HK-D5	
C53	5000		47X507	BPD-005	MD-502	TMSD5	811-005	DC-525	5HK-D6	
C54	1000		80X1	BPD-001	DD-103	TMSD1	801-001	DC-521	5HK-D1	
C55	470	500	47X535	1469-0005		DS7I		MCB345	MS-35	
C56	.047	600	RCP10M3473M	P688-0047	DF-503	PTE6847		PT6147	6TM-S47	
C57	.0047	400	RCP10M4473M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C58	.0047	800	RCP10M4473M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6347	6TM-D47	
C59	.01	400	RCP10M4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C60	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C61A	.01									
B	.01		††6X5	†PA-112-3	†PC-80		†1404-01		†10SC1	
C	350									
C63	.0047	600	RCP10M6472M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C63	.01	400	RCP10M4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C64	1000		80X1	BPD-001	DD-102	TMSD1	801-001	DC-521	5HK-D1	
C65	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C66A	.005					PTE6D5		PT625		
B	.005		*6X7	*PA-115	*PC-100	PTE6S5	*1405-01	PT625	*10SC1	
C	.005					PTE6D5		PT625		
C67	.0047	500	47X543	1464-005		IDR5D5		MCB465	MS-35	
C68	.0047	400	RCP10M4472M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C69	100		47X604	BI00	D6-101	TMS7I	GPIK-101	UC-531	5GA-T1	
C70	.01	800	RCP10M6103M	P688-01	D6-103	PTE6S1	GP2-333-103	PT631	6TM-S1	
C71	.047	600	RCP10M6473M	P688-047		PTE6S47		PT6147	6TM-S47	
C72	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C73	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C74	1000		80X1	BPD-001	DD-103	TMSD1	801-001	DC-521	5HK-D1	
C75	1000		80X1	BPD-001	DD-103	TMSD1	801-001	DC-521	5HK-D1	
C76	.01	400	RCP10M4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C77	470	500	RCM20A227K			IDR5D5		MCB465	MS-35	
C78	.0047	400	RCP10M4472M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C79	.33	200	RCP10M2234M	P488-22		PTE4P22		PT4025	2TM-P22	
C80	.047	200	RCP10M2473M	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C81	4700	500	47X543	1464-005		IDR5D5		MCB465	MS-35	
C82	430	500	RCM20B431K							
C83	.1	400	RCP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C84	330	500	47X570	1489-00035						
C85	200	500	RCM20A201K	1489-0002		5RST2		MCB237	MS-32	
C86	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C87	1000		80X1	BPD-001	DD-102	TMSD1	801-001	DC-521	5HK-D1	
C88	.1	400	RCP10M4104M	P488-1		PTE4P1		PT401	4TM-P1	
C89	.047	400	RCP10M4473M	P488-047		PTE4S47		PT4147	4TM-S47	
C90	.15	400	RCP10M4154M	P488-15		PTE4P15		PT4015	4TM-P15	
C91	.1	200	RCP10M4104M	P288-1	DF-104	PT2P1		PT401	2TM-P1	
C92	500	20000	47X580	HV20C	TV5-502	MM-C20T5	413-501	HV20035A	2GDK-T5	
C93	56	1500	47X598		DIS-560				2GGA-Q56	
C94	10000		47X615	BPD-01	DD-103	TMS8I	811-01	DC-511	5HK-S1	
C95	10000		47X615	BPD-01	DD-103	TMS8I	811-01	DC-511	5HK-S1	

Note 1. When using Ratio Det. Transformer part #9A2295, C54 is 330MMF (part #47X570)
† Items C61A, C61B, C61C, R64A, R64B are combined in one unit.
When replacing items separately C61B and C61C should total 250MMF.
♦ Items C65A, C65B, C65C, R78A, R78B, R78C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FIRESTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω		78X12B	QJ-412*	RTV-406			Contrast - Panel
B	1Meg							Volume & Sw.-tapped ⑥ 250KΩ rear
R2A	50KΩ		40X361-C	Q1-123	AG-44-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	NQ	RS- 3/16	AK-4	DS-37	Attach to R2A
R3A	1Meg		40X334-E	Q1-137	AG-61-S	AB-59	U-54	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R4A	500KΩ		40X333-A	Q1-133	AG-58-S	AB-59	U-50	Brightness
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R4A
R5A	1Meg		40X334-E	Q1-137	AG-61-S	AB-59	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R5A
R6A	150KΩ		40X331-A	Q1-129	AG-52-S	AB-46	U-43	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7	7.5Meg		40X363-B				SU-14	Sync Stability
R8A	4000Ω		40X368-B	Q1-114	AG-80-S	AB-9	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A
R9A	2.5Meg		40X364	Q1- 239	AG-84-S	AB-48	SU-565	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R9A
R10A	2.5Meg		40X364	Not Req.	Q1- 239	AG-84-S	AB-53	SU-565	AGC
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R10A

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B17-109 & P1-310 (Panel)
B13-137X & R2-322 (Rear) & SWITCH 76-2.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FIRESTONE PART No.	IRC PART No.	NOTES
R11	15KΩ		12A-004		
R12	47KΩ		12A-039		
R13	100KΩ		12A-094	BTS-100K	
R14	100KΩ		12A-166	BTS-100K	
R15	160KΩ		12A-167		
R16	1500Ω		12A-183	BTS-1500Ω	
R17	10KΩ		12A-040		
R18	220KΩ		12A-041		
R19	10KΩ		12A-040	BTS-10 KΩ	
R20	15KΩ		12A-040		
R21	9000Ω	5	43X279	1 3/4A-8000	
R22	12KΩ	3	D84123	BTS-12K	
R23	8200Ω 5%		B83822		
R24	47Ω		B83470	BTS-47	
R25	1000Ω		B85102	BTS-1000	
R26	1000Ω		B85102	BTS-1000	
R27	150Ω		B85151	BTS-150	
R28	22KΩ 5%		B83223		
R29	47Ω		B83470	BTS-47	
R30	1000Ω		B85102	BTS-1000	
R31	150Ω		B85151	BTS-150	
R32	2.7Meg		B84275	BTS-2.7Meg	
R33	470KΩ		B84474	BTS-470K	
R34	47KΩ		B84473	BTS-47K	
R35	330KΩ 5%		B83334	BTS-330K 5%	
R36	100KΩ		B84104	BTS-100K	
R37	22KΩ 5%		B83223		
R38	180Ω		B84181	BTS-180	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FIRESTONE PART No.	IRC PART No.	NOTES
R39	1500Ω		B84152	BTS-1500	
R40	4700Ω 5%		B83472	BTS-4700 5%	
R41	5600Ω		C84562	BTA-5600	
R42	1500Ω		B84152	BTS-1500	
R43	33KΩ		B84333	BTS-33K	
R44	1Meg		B84105	BTS-1Meg	
R45	100Ω		B84101	BTS-100	
R46	4700Ω 5%	1	C83472	BTA-4700 5%	
R47	100KΩ		B85104	BTS-100K	
R48	1Meg		B84105	BTS-1Meg	
R49	22KΩ		B84223	BTS-22K	
R50	100KΩ		B85104	BTS-100K	
R51	47KΩ		B84473	BTS-47K	
R52	100Ω		B84101	BTS-100	
R53	1000Ω		B85102	BTS-1000	
R54	56KΩ		B84563		
R55	100KΩ		B84104		
R56	1000Ω		B85102	BTS-1000	
R57	33KΩ		B84333	BTS-33K	
R58	2700		B84271	BTS-270	
R59	68KΩ		B84683	BTS-68K	
R60	22KΩ		B84223	BTS-22K	
R61	22KΩ		B84223	BTS-22K	
R62	68KΩ		B84683	BTS-68K	
R63	10Meg		B85106	BTS-10Meg	
R64A	470KΩ		†76X5	BTS-470K	
B	470KΩ			BTS-470K	
R65	47KΩ		B85473	BTS-47K	
R66	330Ω	1	C84331	BTA-330	
R67	1000Ω	2	B84102	BTS-1000	
R68	47KΩ		B84473	BTS-47K	
R69	10KΩ		B84103	BTS-10K	
R70	270KΩ		B84274	BTS-270K	
R71	1.5Meg		B84155	BTS-1.5Meg	
R72	68KΩ		B84683	BTS-68K	
R73	820KΩ		B84824	BTS-820K	
R74	2200Ω 5%		B83222	BTS-2200 5%	
R75	3300Ω		B84332	BTS-3300	
R76	2200Ω 5%		B83222	BTS-2200 5%	
R77	1000Ω	1	C84102	BTA-1000	
R78A	22KΩ			BTS-22K	
B	8200Ω		*76X7	BTS-8200	
C	8200Ω			BTS-8200	
R79	1.8Meg		B84185	BTS-1.8Meg	
R80	470KΩ		B85474	BTS-470K	
R81	1.6Meg		B84165	BTS-1.6Meg	
R82	2.2Meg		B84225	BTS-2.2Meg	
R83	180KΩ		B84184	BTS-180K	
R84	10KΩ		B84103	BTS-10K	
R85	2.2Meg		B84225	BTS-2.2Meg	
R86	820Ω		B84821	BTS-820	
R87	2200Ω		B84222	BTS-2200	
R88	6800Ω	2	D84882	BTS-6800	
R89	560Ω		B84561	BTS-560	
R90	560Ω		B84561	BTS-560	
R91	1000Ω		B85102	BTS-1000	
R92	100KΩ		B84104	BTS-100K	
R93	100KΩ		B84104	BTS-100K	
R94	4.7Meg		B85475	BTS-4.7Meg	
R95	470KΩ		B85474	BTS-470K	
R96	27KΩ		B84273	BTS-2700	
R97	6800Ω	1	C84682	BTA-6800	
R98	6800Ω	1	C84682	BTA-6800	
R99	33KΩ		B84333	BTS-33K	
R100	2200Ω 5%		B83222	BTS-2200 5%	
R101	5000Ω 5%	1	C83582	BTA-5600 5%	
R102	150KΩ 5%		B83154	BTS-510K 5%	
R103	220KΩ 5%		B83224	BTS-220K 5%	
R104	47KΩ		B84473	BTS-47K	
R105	5600Ω		B84562	BTS-5600	
R106	470KΩ		B84472	BTS-470K	
R107	100Ω	2	D8410I	BW-J-100	
R108	12KΩ	5	43X276	1 3/4A-12K	
R109	5.1Ω		47X239		
R110	1Meg	1	C85105		
R111	100KΩ	2	D85104	BTB-100K	
R112	10KΩ	5	43X272	1 3/4A-10K	
R113	1500Ω	15	43X275	2D-1500	
R114	330Ω	10	43X273	1 3/4A-350	
R115	270KΩ		B85274	BTS-270K	

† Items R64A, R64B, C61A, C61B, C61C are combined in one unit.
♦ Items R78A, R78B, R78C, C65A, C65B, C65C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC ⑨ 2A	582VCT .370ADC	5VAC ⑨ 6A	6.3VAC ⑨1.2A SEC. 4 6.3VAC ⑨8.5A	53X333					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	190Ω	110Ω	54X8	A-8125	A-3003	TBO-5	A-97X	209T1 ⑤	Vert.Osc.Trans.
T3	469Ω tap ⑨, 5Ω, T9, 14Ω, 23Ω, 39Ω	3.5Ω SEC. 2 00	53X330		HVO-8⑫ ⑫ & MWC-1	TFB-18⑫ ⑫ & TW-5	D-32⑫ ④ ⑫ & WC-11	232T1 ⑫ & 212R1	Horiz.Output Trans.
T4	1500Ω tap ⑨,4Ω		51X156	A-8123 ⑤	A-3037 ⑤	TSO-9 ⑤ ⑫	A-102X ⑤	222T1 ⑤	Vert.Output Trans.
T5A	23Ω		9A2274	DY-9A ⑦	MDF-72	TY-3 ⑥	Y-17	21ID3	Horiz.Deflection Coils
B	47Ω								Vert. Deflection Coils
T6	15Ω		9A2262		MWC-6	TW-7	WC-12⑫	213R1	Horiz. Linearity Coil
T7	.8Ω		9A2183	WC-4⑩	MWC-2 ⑩ ⑫	TW-2 ⑩ ⑫		20IR4 ⑩	Width Coil

① Drill new mounting holes.
② Connect original terminal #8 to new terminal #9, original #5 to new #7, original #4 to new #5, original #1 to new #1. Connect primary of MWC-1 across terminals 3 and 1 and secondary to AFC (if picture is out of phase, reverse secondary).
③ Connect terminal #8 to terminal #7, then connect original #8 to new #9, original #5 to new #7 and 8, original #4 to new #5, original #1 to new #1. Connect primary of TW-6 across terminald 3 and 1 and secondary to AFC (if picture is out phase, reverse secondary).
④ Connect terminal #8 to terminal #7, then connect original #8 to new #9, original #5 to new terminal 7 and 8, original #4 to new #5, original #1 to new #3. Connect primary of WC-11 across terminals 3 and 1 and secondary to AFC (if picture is out of phase, reverse secondary)
⑤ Drill one new mounting hole.
⑥ Connect as auto transformer.
⑦ Use original horizontal deflection coil network if necessary.
⑧ Use original horizontal deflection coil network.
⑨ Connect to coded blue and green terminals.
⑩ Bend clip or use original slider and core.
⑪ Enlarge mounting hole.
⑫ Use Fig. 4 of Instruction booklet packed with unit for terminal connections.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T8	5.8KΩ	3.6Ω	450Ω	.85Ω	51X150H	A-3877	A-2930	RO-9 ①	S-3X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA FIRESTONE PART No.	REPLACEMENT DATA VIKING PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	10"	P.M.	3.6Ω	12A480 12A504 ① 12A502 ②	10J11	10A31	① 8" PM speaker, not used in all Models. ② 12" PM speaker used in console Models.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	Ant. Coil	0Ω CT	0Ω	A9A2297-2				Channel 2
B	Ant. Coil	0Ω CT	0Ω	A9A2297-3				Channel 3
C	Ant. Coil	0Ω CT	0Ω	A9A2297-4				Channel 4
D	Ant. Coil	0Ω CT	0Ω	A9A2297-5				Channel 5
E	Ant. Coil	0Ω CT	0Ω	A9A2297-6				Channel 6
F	Ant. Coil	0Ω CT	0Ω	A9A2297-7				Channel 7
G	Ant. Coil	0Ω CT	0Ω	A9A2297-8				Channel 8
H	Ant. Coil	0Ω CT	0Ω	A9A2297-9				Channel 9
I	Ant. Coil	0Ω CT	0Ω	A9A2297-10				Channel 10
J	Ant. Coil	0Ω CT	0Ω	A9A2297-11				Channel 11
K	Ant. Coil	0Ω CT	0Ω	A9A2297-12				Channel 12
L	Ant. Coil	0Ω CT	0Ω	A9A2297-13				Channel 13
L2	Fil.Choke	0Ω		34A-546				
L3	Neutr.Coil	0Ω		31B-286				
L4A	RF, Mixer Grid & Osc. Coil	0Ω		A9A2296-2				Channel 2
B	RF, Mixer Grid & Osc. Coil	0Ω		A9A2296-3				Channel 3
C	RF, Mixer Grid & Osc. Coil	0Ω		A9A2296-4				Channel 4
D	RF, Mixer Grid & Osc. Coil	0Ω		A9A2296-5				Channel 5
E	RF, Mixer Grid & Osc. Coil	0Ω		A9A2296-6				Channel 6
F	RF, Mixer Grid & Osc. Coil	0Ω		A9A2296-7				Channel 7
G	RF, Mixer Grid & Osc. Coil	0Ω		A9A2296-8				Channel 8
H	RF, Mixer Grid & Osc. Coil	0Ω		A9A2296-9				Channel 9
I	RF, Mixer Grid & Osc. Coil	0Ω		A9A2296-10				Channel 10
J	RF, Mixer Grid & Osc. Coil	0Ω		A9A2296-11				Channel 11
K	RF, Mixer Grid & Osc. Coil	0Ω		A9A2296-12				Channel 12
L	RF, Mixer Grid & Osc. Coil	0Ω		A9A2296-13				Channel 13
L5	Fil. Choke	0Ω		34A-575				
L6	RF Choke	0Ω		31B-295				
L7	1st. Video IF	1Ω		31A-978				
L8	RF Choke	1.2Ω		31B-230				
L9	Fil. Choke	0Ω		9A2033	19-3001	TV-189	4602	1 Microhenry
L10	2nd.Video IF	.3Ω	.3Ω	9A2230	17-1063		6349	
L11	Fil. Choke	0Ω		9A2033	19-3001	TV-189	4602	1 Microhenry
L12	3rd.Video IF	.3Ω	.3Ω	9A2230	17-1064		6350	
L13	Fil. Choke	0Ω		9A2033	19-3001	TV-189	4602	1 microhenry
L14	RF Choke	2.5Ω		9A1979	19-3036	TV-180	4629	36 Microhenries
L15	4th.Video IF	.2Ω		9A2226		TV-101	6187	Includes trap
L16	Series Peaking Coil	7Ω		36AJ0	19-4060	TV-180 †	6173 †	60 Microhenries, wound on 22KΩ resistor
L17	Shunt Peaking Coil	25Ω		36AJ1	19-3500	TV-188	6174	500 Microhenries
L18	4.5MC Trap	.3Ω		9A2074	20-1004	TV-151	1470	
L19	Series Peaking Coil	2.5Ω		9A1979	19-3036	TV-180	6176	36 Microhenries
L20	Shunt Peaking Coil	9Ω		36AJ6	19-3075 ▲	TV-181A	6173 ▲	80 Microhenries, wound on 1.5KΩ resistor
L21	Series Peaking Coil	13Ω		36AJ2	19-4180	TV-184 †	4644 †	160 Microhenries, wound on 22KΩ resistor
L22	Shunt Peaking Coil	14Ω		36A2	19-3180	TV-184	6180	190 Microhenries
L23	1st.Sound IF	2.5Ω		9A2268	17-1031 ▲	TV-113 †	1470A ■	
L24	2nd.Sound IF	1.5Ω	1.5Ω	9A2170		TV-113	6303	
L25	Ratio Det.	3.5Ω	.6ΩCT	9A2269 *	17-1033	TV-110	1466	Tertiary winding-.3Ω
L26	Horiz.Osc.	70Ω		9A2096	19-1576	TV-163	6310	

* Some Models use Ratio Det. part #9A2295 (has numerical terminal identification) Ratio Det. (part #9A2269) has alphabetical terminal identification)
† Parallel with 22KΩ resistor
▲ Parallel with 1.5KΩ resistor
■ Drill mounting holes
† Detune unused winding
■ Add 47MMF Cap. externally

FIRESTONE MODELS 13-G-128, 13-G-129, 13-G-130, 13-G-132, 13-G-145, 13-G-146

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L27	.270ADC	42Ω	1.68 Hy.	52X91	C-2326 ①	C-2996 ①	TR-1733 ①	C-17X ①

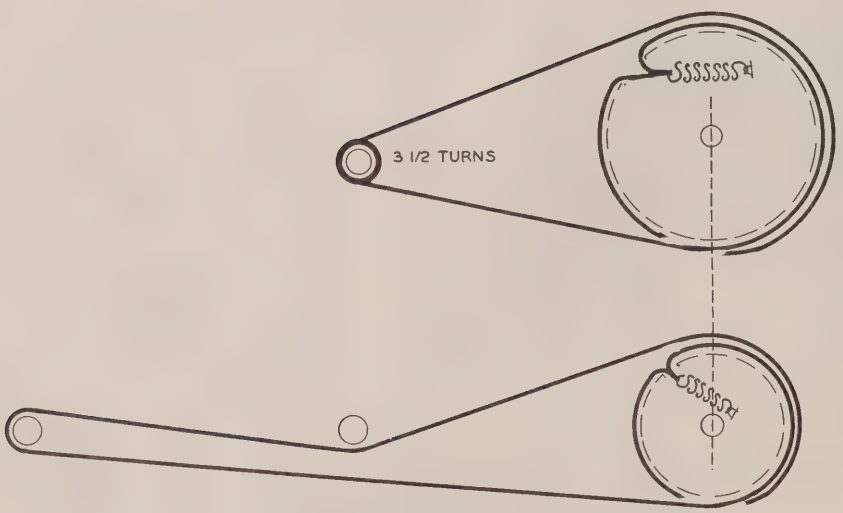
① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FIRESTONE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	4/10A 125V	16X147-3	16X146	313.400 (4/10A-125V)	357001	MDL4/10	4405

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M2	Dial Light	7A32	Type #51 - Channel Indicator
M3	Dial Light	7A32	Type #51 - UHF Dial
M4	VHF Tuner	25A-1104	
M5	UHF Tuner	25A-1105	
M6	Trap, UHF Filter		
M7	Crystal		1N72 (1N82 may be used) UHF tuner
M8	Magnet	2A426	Focus and centering
M9	Magnet	2A407	Ion Trap
	Back Cover	S-14X69	
	Dial Glass	58X768	UHF
	Knob	10A820-1	Fine tuning (Maroon) } Models 13-G-128, 13-G-130; 13-G-145
	Knob	10A821-1	Contrast (Maronn) } Models 13-G-128, 13-G-130; 13-G-145
	Knob	10A822-1	Channel Selector (Maroon) } Models 13-G-128, 13-G-130; 13-G-145
	Knob	10A779	Volume (Maroon) } Models 13-G-128, 13-G-130; 13-G-145
	Knob	10A820-2	Fine tuning (Beige) } Models 13-G-129, 13-G-132, 13-G-146
	Knob	10A821-3	Contrast (Beige) } Models 13-G-129, 13-G-132, 13-G-146
	Knob	10A822-3	Channel Selector (Beige) } Models 13-G-129, 13-G-132, 13-G-146
	Knob	10A812-4	Volume (Beige) } Models 13-G-129, 13-G-132, 13-G-146



UHF DIAL CORD STRINGING

TROUBLE SHOOTING AIDS (cont)

3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light check AC interlock assembly, switch on volume control and T1. If filaments light check M1, V23, V24 and B+ filter and decoupling network components.

SMALL PIX AND / OR DIM RASTER

Substitute V23 and V24. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V19, V20, V21 and V22. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check R109, R110, C92, T3, T5A and other associated components.	Check C82, C84, C85, R103, R104, R106 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, V21, V22, V23 and V24. Check picture tube and associated components.

BLOOMING

Check by substitution V19, V20, V21, V22, V23 and V24. Check R109, R110, C92, T3, T5A, picture tube and other associated components.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX (VHF)

Substitute V1, V2, V4, V5, V6 and V7. Check associated components.

RASTER NO SOUND NO PIX (UHF)

Substitute V1, V2, V3, V4, V5, V6 and V7. Check associated components. NOTE! It may be necessary to try several tubes in the UHF tuner to find one that will operate satisfactory.

NO RASTER NO SOUND

See "Dead Set".

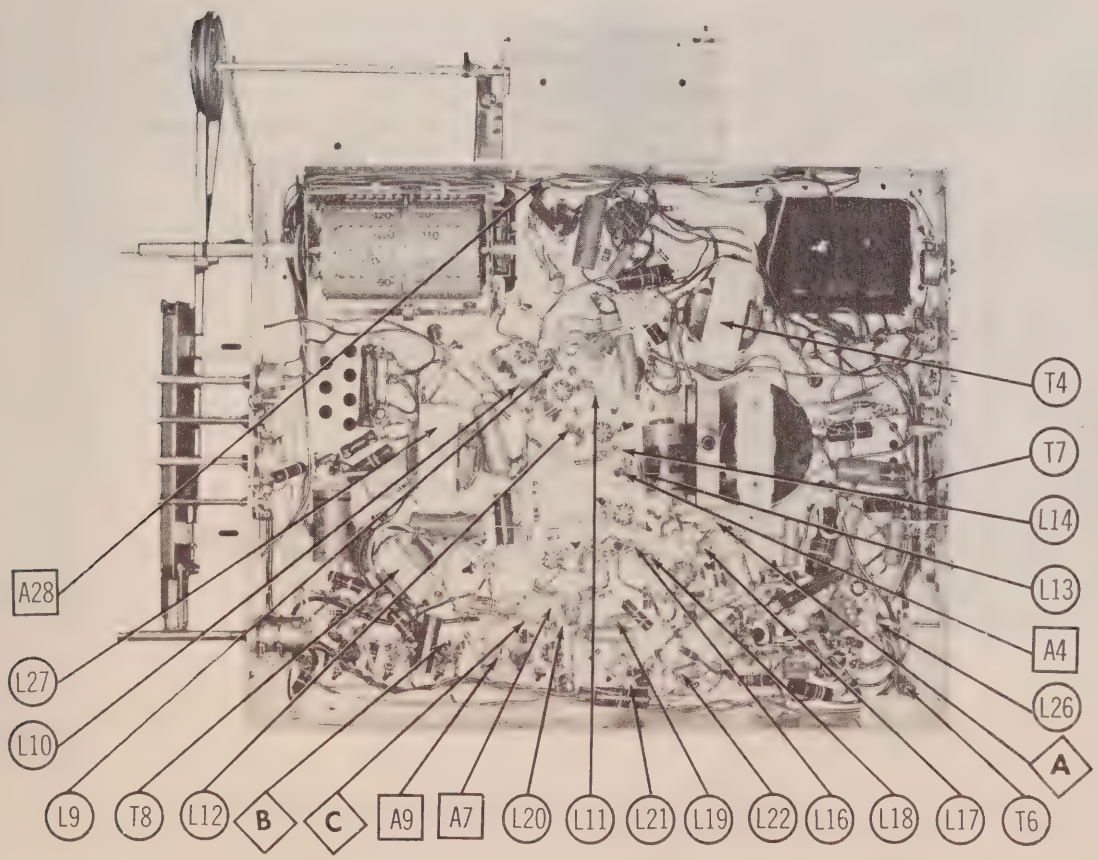
TOTAL LOSS OF SYNC

Check by substitution V16 and V8. Check associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

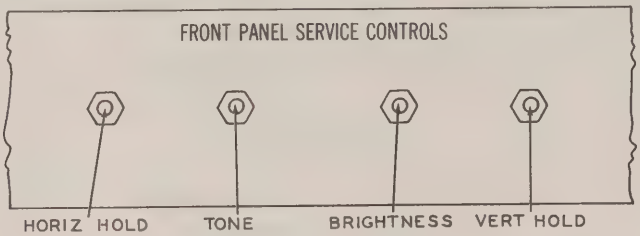
Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

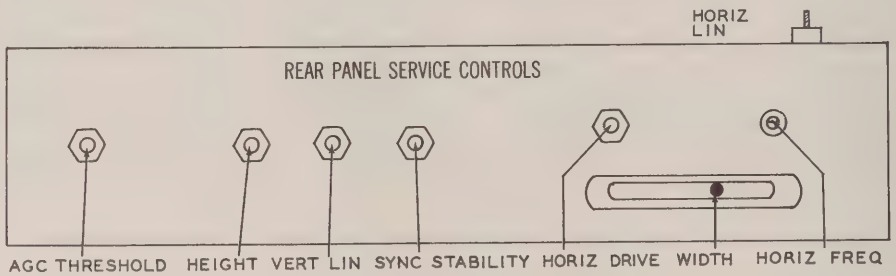
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 4 wood screws holding wood strip at bottom of safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).





SPECIAL ADJUSTMENTS - SYNC STABILITY CONTROL

Tune set to strongest TV signal available turn the sync stability control clockwise until bending of the picture occurs at the top, then turn counter clockwise until the bending just disappears.

AGC THRESHOLD CONTROL - Tune in strongest TV signal . Turn the control clockwise until overloading appears. turn control counter clockwise until overloading disappears.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal frequency slug (L26) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF detector buzz, adjust the ratio detector secondary (L25) located on top of chassis. (See tube placement chart).

FUSES

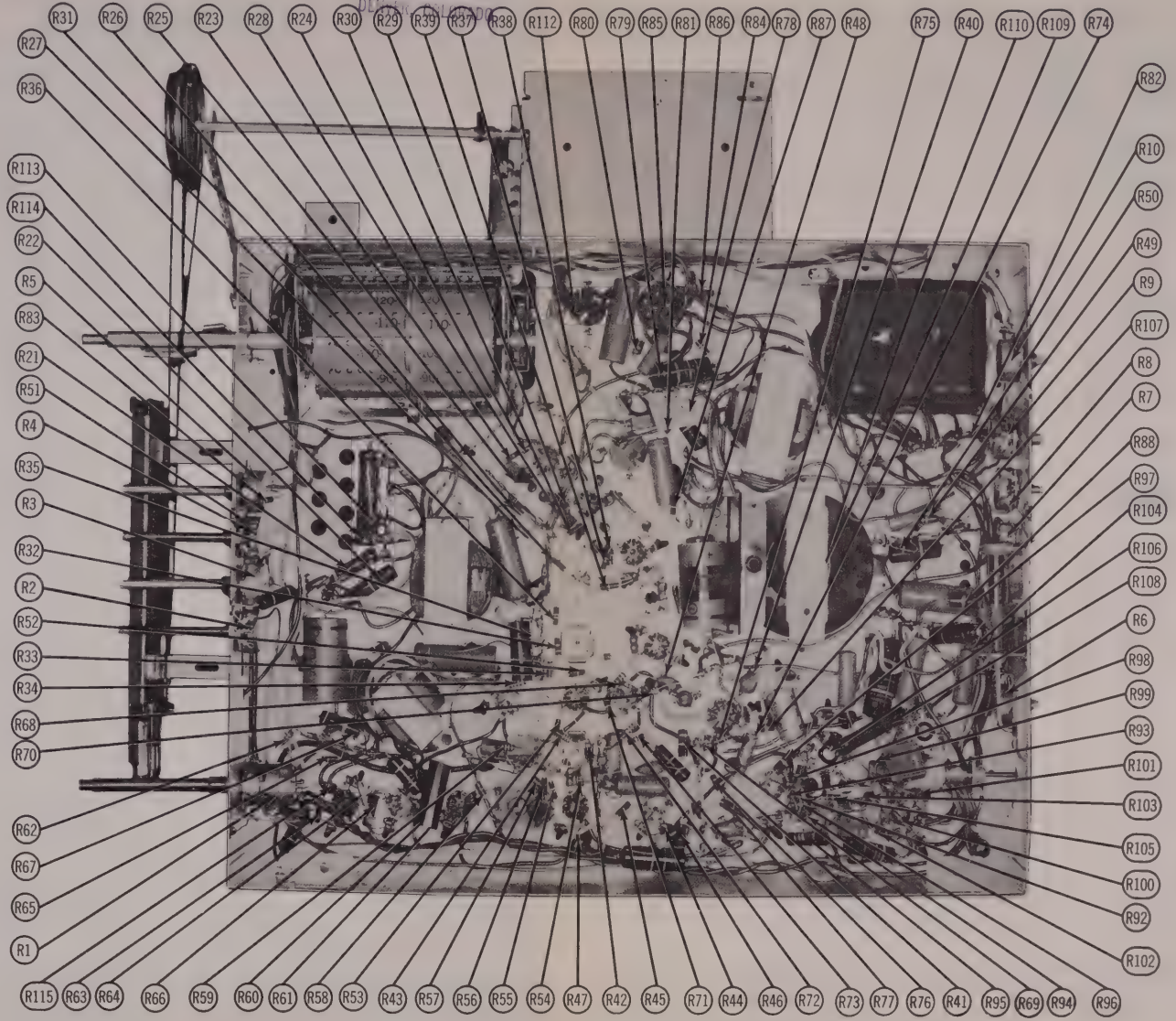
One fuse is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of the picture tube located flush against the yoke. Turn the disk-like knob and at the same time rotate the ring around the tube until picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 2 wood and 2 metal screws. Remove rear cover.
3. Disconnect VHF built-in antenna. Loosen 4 wood screw. Remove VHF and UHF antenna bracket.
4. Disconnect speaker. Remove 4 speaker nuts. Remove speaker.
5. Remove 5 chassis bolts. Remove chassis.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. DRANNENSHIP
3014 MEADE ST.
DENVER, COLORADO

MOTOROLA
MODEL CTA3

TRADE NAME	Motorola Model CTA3 (For 1953 Chevrolet Cars)
MANUFACTURER	Motorola, Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built Automobile Superheterodyne Receiver
TUBES (Six)	Types 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6AT6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 4.6 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1605KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary an output reading. Use an insulated alignment screwdriver for adjusting.
For adjustment of tuner cores use Motorola alignment tool #66A76278 or equivalent.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400%Mod)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum deflection.
2.	See Fig.1	High side thru dummy (Fig.1). Low side to chassis.	1605KC	"	"	A5	"
3.	"	"	1300KC	1300KC	"	A6, A7	"
4.	Alignment of the tuning cores should not be required in the field. If their alignment becomes necessary the cores should be backed all the way out and the trimmers A5, A6 and A7 should be peaked at 1605KC in the order given.						
5.	See Fig.1	High side thru dummy (Fig.1). Low side to chassis.	1180KC	With manual tuning control set pointer 1 1/32" from high frequency end stop	Across voice coil	A8, A9 A10	Adjust for maximum deflection.
6.	With receiver installed in car and antenna fully extended tune to a weak station near 1400KC and adjust A7 for maximum volume.						

PUSH BUTTONS ADJUSTMENT

To set push buttons, tune manually to the desired station. Pull the push button to be set all the way out, then press the push button all the way in to lock. Repeat the above procedure for remaining push buttons.

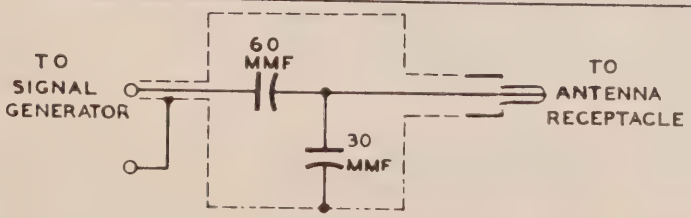


FIG. 1

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL CTA3

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amp.	6BD6	6BD6	7BK	
V4	Det-AVC-AF Amp.	6AT6	6AT6	6CK	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■15	350	23A485677	AFH3-104		CO77		FP328	TVL-3630	
B	▲10	250								
C	20	25								
C2	.05	100	8R13514	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	90		21A591682							
C4	.006	100	8A4529	P288-006	D6-602	PJ2D6	GP2-333-602	PT426	2TM-D6	
C5	.05	100	8R13514	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C6	4.7		21R115955	SI5	D6-050		GP1K-050	ZT-555		
C7	100		21R120124	SI100NP0	TCZ-100		NP0-333-101	ZT-531	5TCC-T1	
C8	47		21R115890	SI47N750	TCN-47			NT-5447	5TCU-Q47	
C9	400		21A71672							
C10	.05	400	8R14791	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C11	.02	400	8R12699	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C12	10000		21R482726	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C13	.006	400	8R71910	P488-006	D6-602	PTE4D6	GP2-333-602	PT426	4TM-D6	
C14	10000		21R482726	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C15	470		21R115856	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C16	.006	400	8K71910	P488-006	D6-602	PTE4D6	GP2-333-602	PT426	4TM-D6	
C17A	300		21A522033							
B	300									
C18	.5	100	8K17028	VHC-36		MP-2P5		RF-480	HC-3	
C19	.5	100	8K17028	VHC-36		MP-2P5		RF-480	HC-3	
C20	.03	1000	8K400883	P1088-03		PTE16S3		PT1613	MB-S3	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	100KΩ	½	18K530148				UF15R	Tone tapped at 40K (panel)
B	250KΩ	½	Not Req.				UR254-T753	Volume (Rear)
C	Switch		Not Req.				US-26	Attach to R1B

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	NOTES
R2	1Meg	½	6R6004	BTS-1Meg	
R3	560Ω	½	6R6291	BTS-560	
R4	18KΩ	½	6R5591	BTS-18K	
R5	22KΩ	½	6R6028	BTS-22K	
R6	82Ω	½	6R2035	BTS-82	
R7	6800Ω	2	6R5690	BTB-6800	
R8	1Meg	½	6R6004	BTS-1Meg	
R9	15KΩ	½	6R6477	BTS-15K	

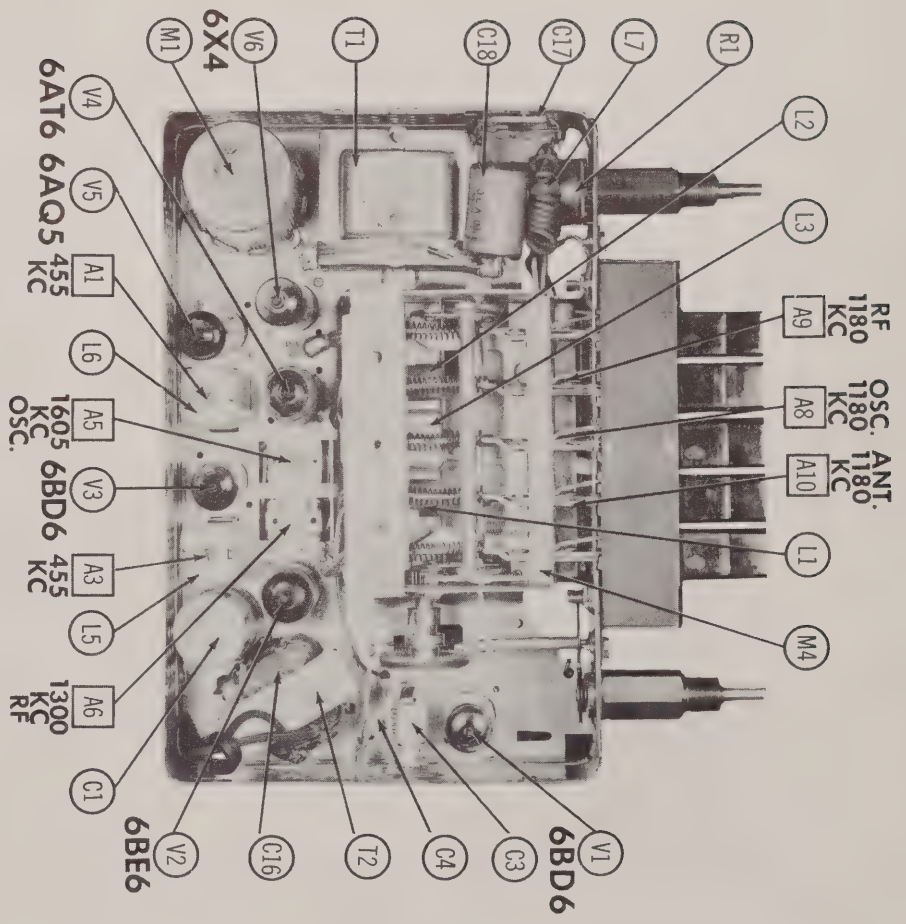
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	NOTES
R10	2.2Meg	½	6R3927	BTS-2.2Meg	
R11	330KΩ	½	6R6014	BTS-330K	
R12	270KΩ	½	6R6414	BTS-270K	
R13	270Ω	½	6R6432	BTS-270	
R14	2200Ω	2	6R5687	BTB-2200	
R15	56Ω	½	6R5614	BTS-56	
R16	56Ω	½	6R5614	BTS-56	

TRANSFORMER (VIBRATOR)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VCT 2.3A	420VCT .042A			25C501303D		P-3068		V-16K ①

① Drill new mounting holes.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	7.3KΩ	3.6Ω	632Ω	.73Ω	25B502330	A-3878①	A-3020	R0-13 ①	S-7X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6 X 9"	PM	3.6Ω	50C513193 50C513544 ①	ST-810 Mod.P69-V	69A2	① Alternate 6 x 9" speaker

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	13Ω		24K522272				Less core; core Part # 76K522275 (with screw)
L2	RF Coil	13Ω		24K522271				Less core; core Part # 76K522275 (with screw)
L3	Osc. Coil	.8Ω	2.8Ω	24K522270				Less core; core Part # 76K522275 (with screw)
L4	Fil. Choke	0Ω		24A522284	19-3001	TV-189	6175	.4Microhenry
L5	Input IF	17Ω	17Ω	24C485553	16-6758	BC-352	12-C1	
L6	Output IF	17Ω	17Ω	24K485554	16-6770	BC-355	12-C6	
L7	Fil. Choke	0Ω		24K522091				
L8	Vibrator Hash Choke	.1Ω		24A512119				47 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115∿	48B3333	5342	859	5342	

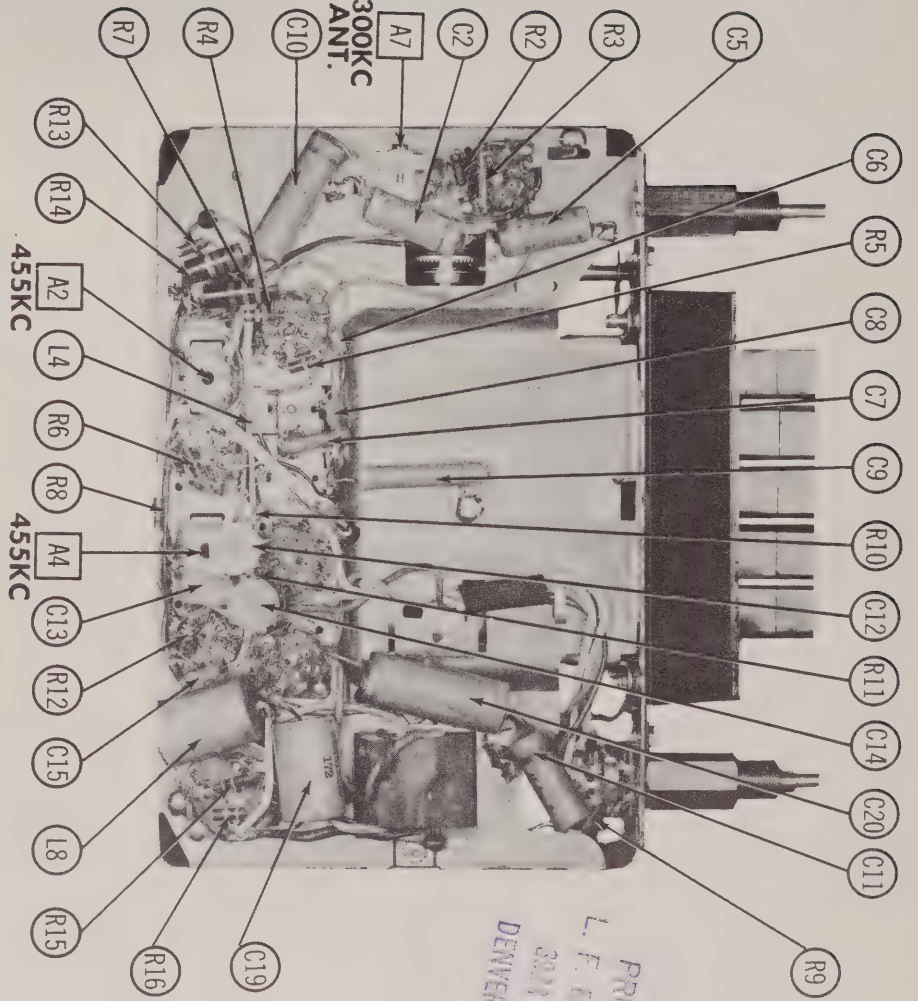
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	9A 32V	65K16248	9K530099	307009 (SFE-9A)	155009	SFE9	HRH

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial light	65X10867	# 44 bayonet
M4	Tuner	77D522054	AT-117 automatic complete
A5	Trimmer cap	20A77537	5-80MMF-Osc. Adj.
A6	Trimmer cap	20A481526	20-180MMF-RF. Adj.
A7	Trimmer cap	20A513232	20-180MMF-Antenna Adj.
	Knob	36B530118	Disc (tone)
	Knob	36K530119	Disc (dummy for tuning shaft)
	Knob	1V530175	Control (2) volume and tuning'
	Push Button	1V520079	With clip
	Dial scale	34B530121	Glass

CHASSIS—BOTTOM VIEW



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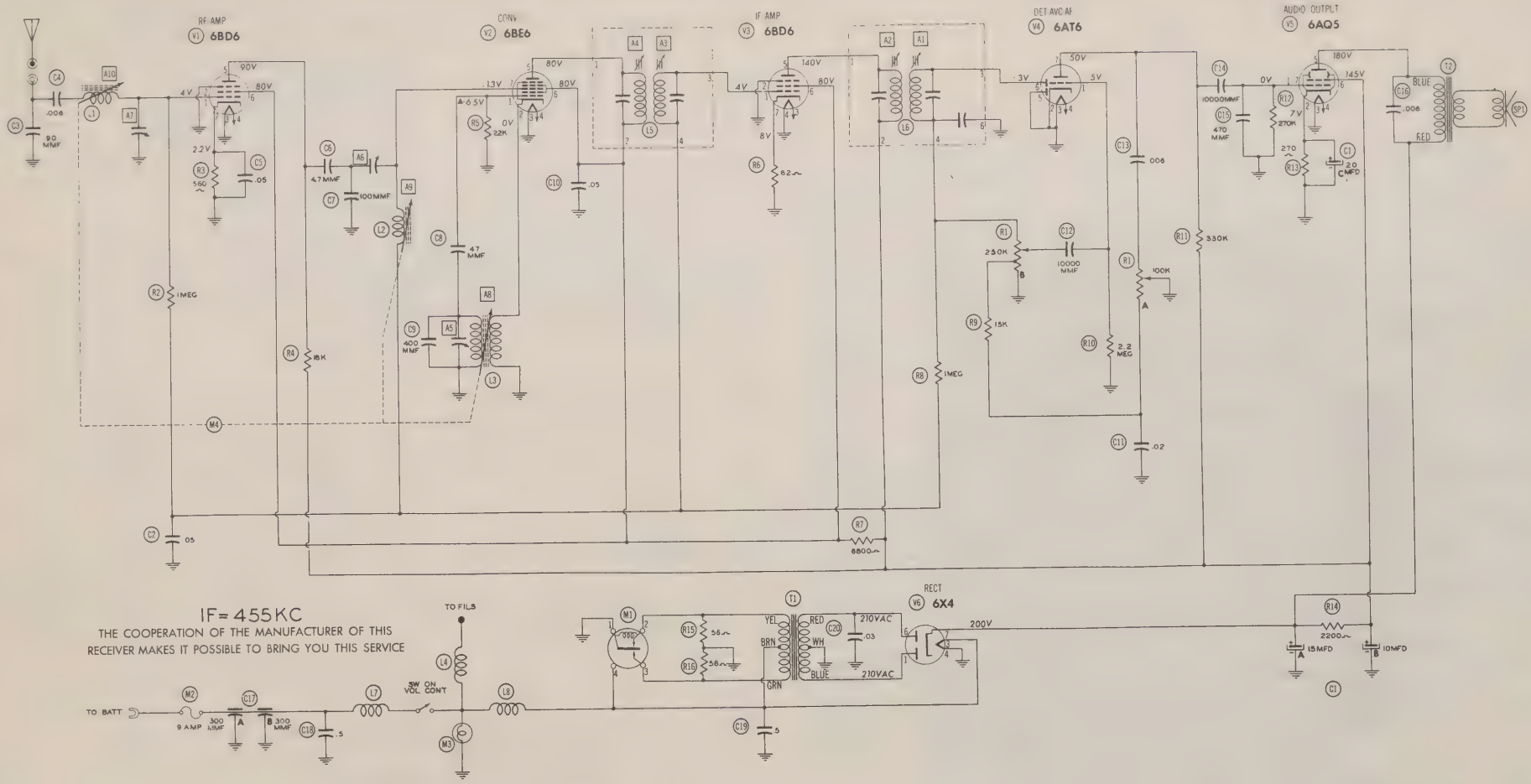
MOTOROLA
MODEL CTA3

SET 230 FOLDER 7

MOTOROLA
MODEL CTA3



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BD6	2.2Meg	0Ω	0Ω	.1Ω	† 20KΩ	† 9KΩ	560Ω
V 2	6BE6	22KΩ	2.8Ω	0Ω	.1Ω	† 9KΩ	† 9KΩ	1.2Meg
V 3	6BD6	1.2Meg	0Ω	.1Ω	0Ω	† 2.2KΩ	† 9KΩ	82Ω
V 4	6AT6	2.2Meg	0Ω	0Ω	.1Ω	0Ω	250KΩ	† 330KΩ
V 5	6AQ5	270KΩ	270Ω	0Ω	.1Ω	† 630Ω	† 2.2KΩ	270KΩ
V 6	6X4	440Ω	.1Ω	.2Ω	0Ω	INF	475Ω	2Meg

† MEASURED FROM PIN 7 OF V6

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1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

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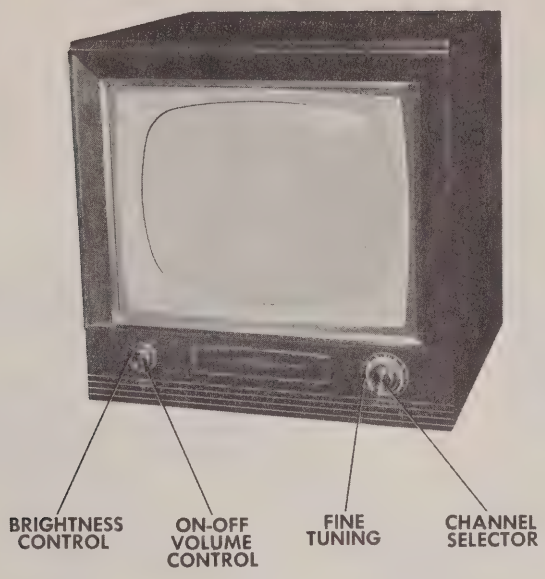

RCA VICTOR MODEL 21-D-358

TRADE NAME	RCA Victor	MODELS	CHASSIS
		21-D-358	KCS81F
		21-D-358U	KCS81J
		21-D-368	KCS81F
		21-D-368U	KCS81J
		21-D-377	KCS81F
		21-D-377U	KCS81J
		21-D-378	KCS81F
		21-D-378U	KCS81J
		21-D-379	KCS81F
		21-D-379U	KCS81J
		21-D-380	KCS81F
		21-D-380U	KCS81J
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, N.J.		
TYPE SET	Television Receiver		
POWER SUPPLY	110-120 Volts AC-60 Cycle		
TUNING RANGE	Channels 2 thru 13, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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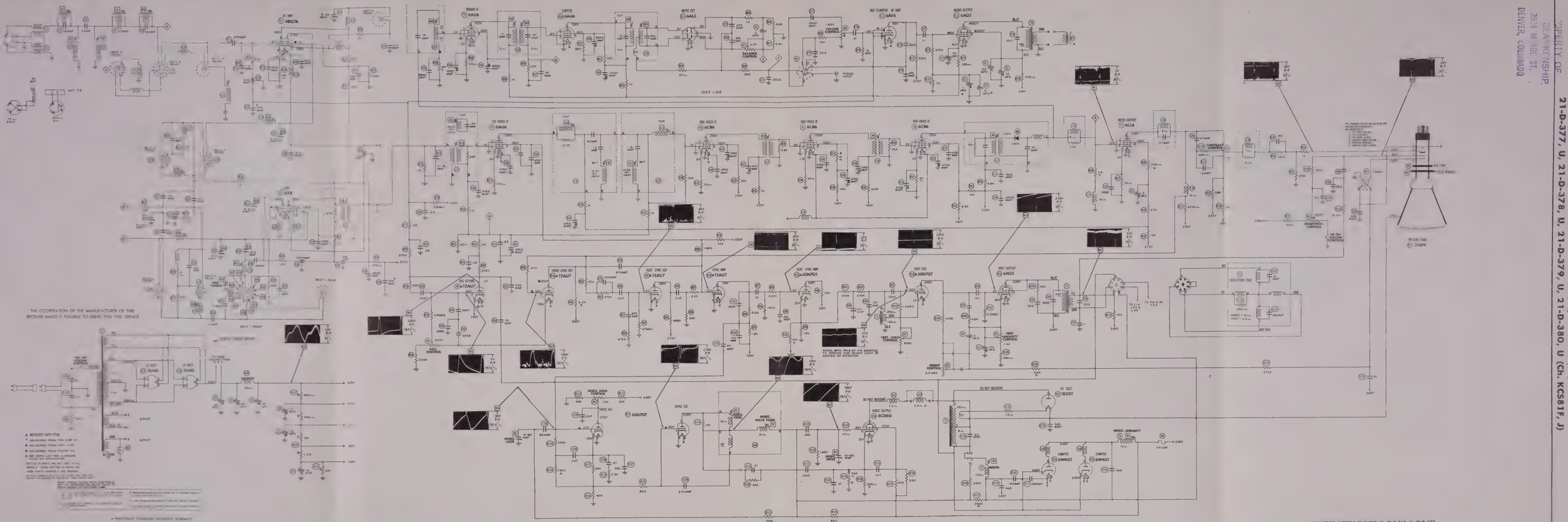
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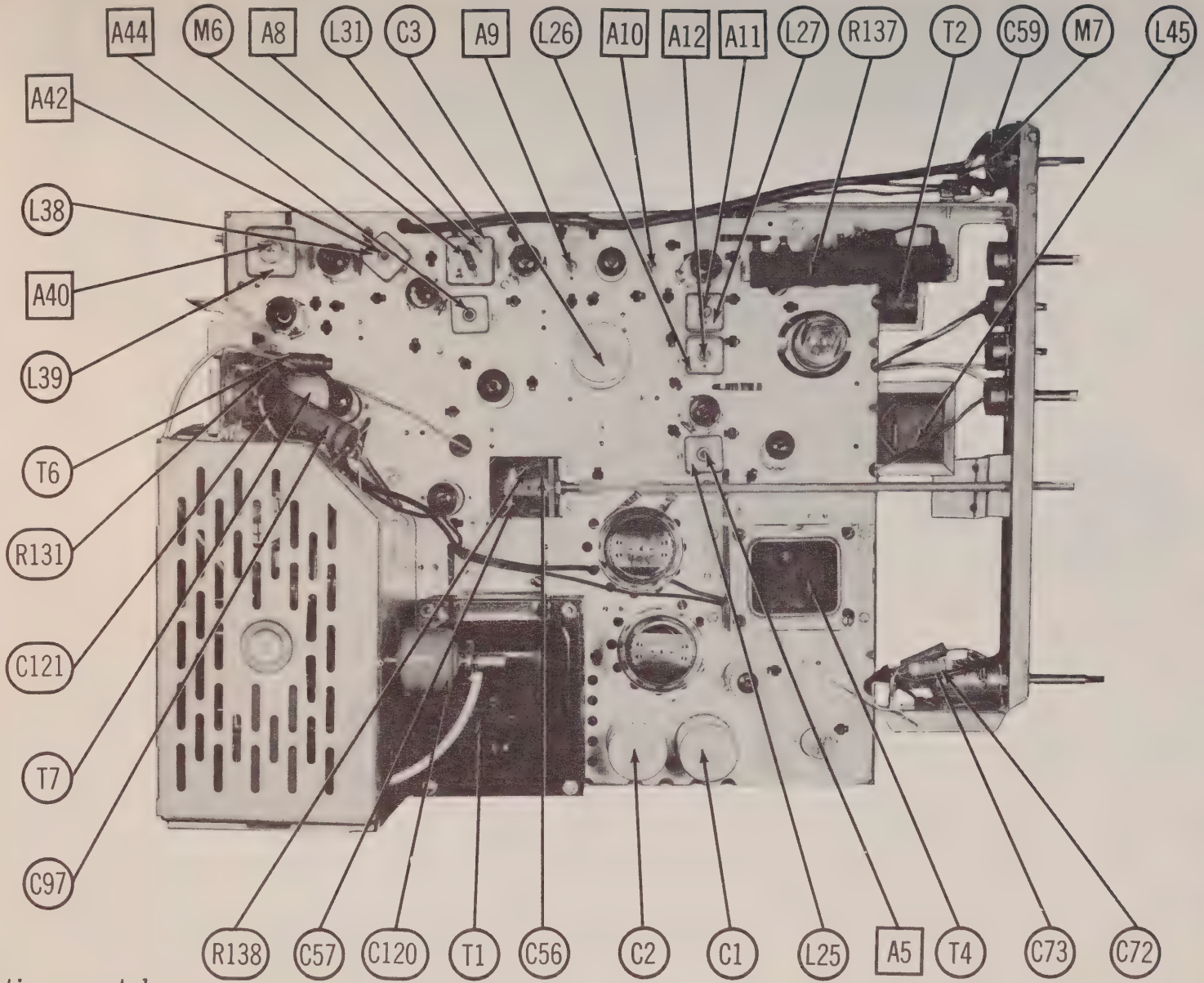

For tube location see tube placement chart page 10 .

CHASSIS TOP VIEW

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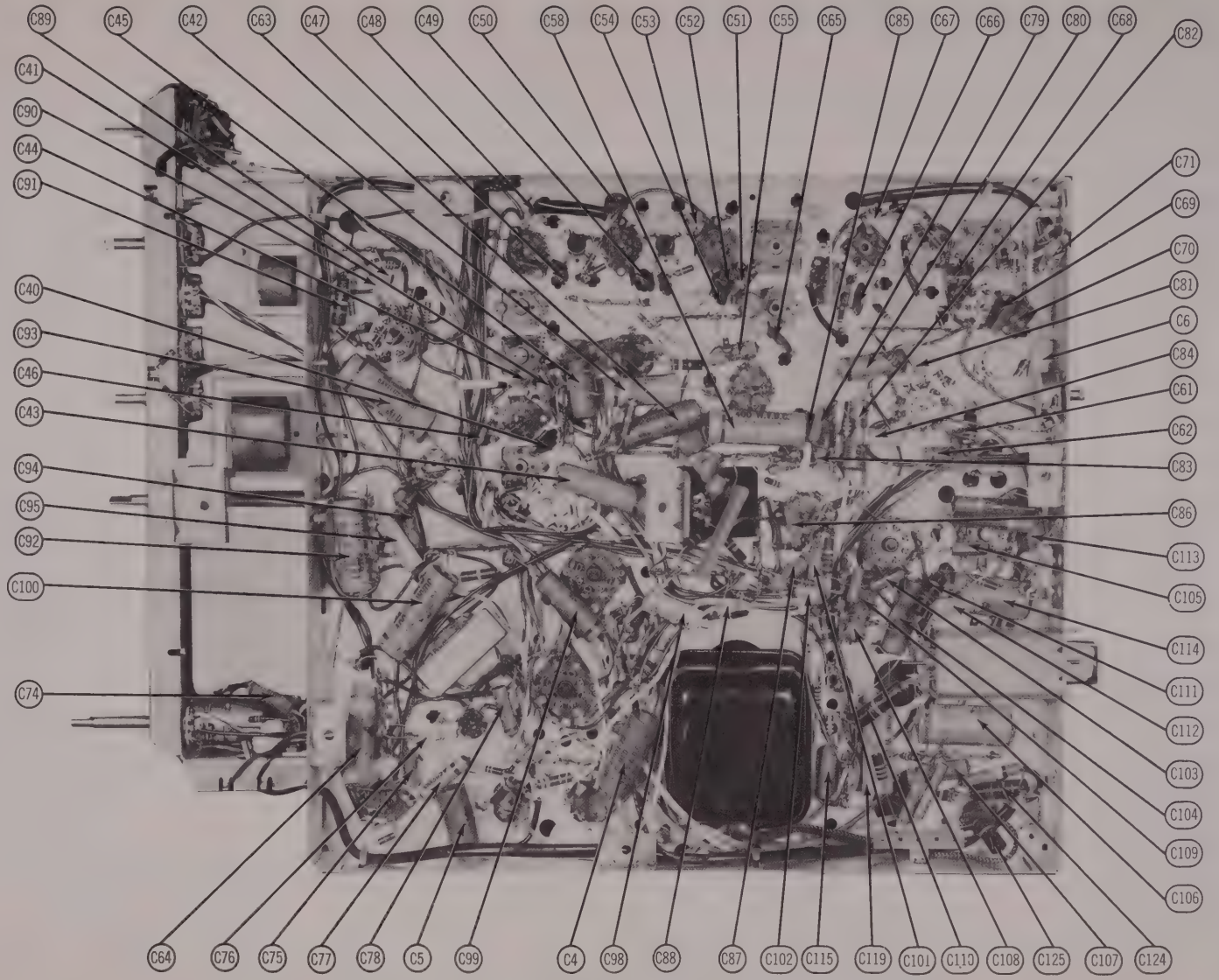

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

ANTENNA MATCHING UNIT ALIGNMENT

The antenna matching unit is properly aligned at the factory. The RF unit is aligned with a particular antenna matching unit in place. If a new antenna unit is installed, the RF unit should be realigned. Alignment should not be attempted without the proper alignment facilities.
Disconnect the lead from the FM trap L7 to the channel selector switch. Use a short jumper to connect point (A) on the matching unit through a .001MFD capacitor to pin 1 (grid) of 6CB6 (V4).
Remove 6CB6 (V3) from its socket.
Cover of the matching unit must be in place during alignment. Connect the ends of a 1000Ω potentiometer across a 7.5 volt battery capable of withstanding considerable current drain. Connect the positive terminal to chassis and the potentiometer arm to the ungrounded side of C42. Set the potentiometer arm to obtain -5 volts at this point.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	Not used	45.75MC	Any	Vert. Amp. to point (B). Low side to chassis.	A1	Set oscilloscope to maximum and adjust A1 for MINIMUM 400~ response.
2.	"	"	"	41.25MC (400~Mod)	"	"	A2	Adjust for MINIMUM response on scope.
3.	"	"	50MC (10MC Swp)	50MC 52MC 53MC	"	Vert. Amp. thru detector probe (Fig. 1). to point (A). Low side to chassis.	A3, A4	Remove the .001MFD capacitor (see instructions above) from point (A) and connect resistor from point (A) to chassis using short leads. Adjust A3 and A4 to obtain response curve as in Fig. 2. Repeat steps 1, 2 and 3 until no further improvement is made. Remove the 300Ω resistor and the detector probe. Restore the connection between L7 and the channel switch. Replace V3.

PICTURE IF TRAP ALIGNMENT

Leave bias connected as under antenna matching unit alignment. Set potentiometer arm to obtain -1 volt at the ungrounded side of C42.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	Direct	Across terminals "A" and "B" of L25	39.25MC 41.25MC 47.25MC	Any	DC probe to point (B). Common to chassis.	A5, A6, A7	Adjust for MINIMUM deflection.

VIDEO IF ALIGNMENT FOR RECEIVERS USING VHF TUNER KRK29

Leave bias connect as under picture IF trap alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to terminal "A" of L25. Low side to chassis.	Not used	43.7MC 45.5MC 41.8MC	Any not used locally	Use VTVM. DC probe to point (B). Common to chassis.	A8 A9 A10	Adjust for maximum deflection. If necessary, attenuate signal generator to maintain 1 volt at VTVM.
6.	.001MFD Ceramic Capacitor	High side thru .001MFD to pin 1 (grid) of 6AU6 (V3). Low side to chassis.	43MC (10MC Swp)	41.25MC 42.0MC 45.0MC 45.75MC 46.5MC 47.25MC	"	Vert. Amp. to point (B). Low side to chassis.	A11, A12	Shunt R35, R40 and primary of L31 with 330Ω carbon resistors. Adjust A11 and A12 for maximum gain and response similar to Fig. 3. For final adjustment attenuate generator to obtain .5 volt peak to peak on scope.
7.	Direct	High side to point (C). Low side to tuner chassis Use very short leads.	"	41.25MC 41.9MC 44.5MC 45.75MC	"	"	A13, A14, A15	Adjust for response similar to Fig. 4. Adjust A15 to place 41.25MC marker at 85% response as shown in Fig. 4. Disconnect the three 330Ω carbon resistors used in step 6.

VIDEO IF ALIGNMENT FOR RECEIVERS USING VHF-UHF TUNER KRK12B

Connect the potentiometer arm of the bias supply to point (A). Connect positive terminal to chassis. Adjust for -1 volt at point (A).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to terminal "A" of first video IF transformer. Low side to chassis.	Not used	43.7MC 45.5MC 41.8MC	Any not used locally	Use VTVM DC probe to point (B). Common to chassis.	A8 A9 A10	Adjust for maximum deflection. If necessary attenuate signal generator to maintain 1 volt at VTVM.
6.	.001MFD Ceramic Capacitor	High side thru .001MFD to pin 1 (grid) of 6AU6 (1st. Video IF Amp.). Low side to chassis.	43MC (10MC Swp)	41.25MC 42.0MC 45.0MC 45.75MC 46.5MC 47.25MC	"	Vert. Amp. to point (B). Low side to chassis.	A11 A12	Shunt secondary of third and fourth video IF transformers with 330Ω carbon resistor. Shunt primary of fifth video IF transformer with 330Ω carbon resistor. Adjust A-11 and A12 for maximum gain and response similar to Fig. 3. For final adjustmsnt attenuate generator to obtain 0.5 volt peak to peak on scope.
7.	.0015MFD Ceramic Capacitor	High side thru .0015MFD to front terminal of 1N82 crystal holder. Low side to chassis. Use very short leads	"	41.25MC 41.9MC 44.5MC 45.75MC	5	Vert. Amp. thru detector (Fig. 1) to pin 5 (plate) of first video IF amplifier (6AU6). Low side to chassis.	A13 A14 A15 A16	Connect 180Ω carbon resistor from plate of first video amplifier to the junction of the 1000Ω plate decoupling resistor and the 4700MMF decoupling capacitor. for minimum capacity. Preset A15 for minimum capacity. Adjust A13 and A14 for maximum gain at 43.5MC with 45.75MC at 70% on response curve. Adjust A15 to place 41.25MC marker at 85% as in Fig. 4. Adjust A16 for maximum gain. Retouch A13 and A14, if necessary to obtain response similar to Fig. 4. Disconnect the three 330Ω and 180Ω resistors used in steps 6 and 7.

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ALIGNMENT INSTRUCTIONS (cont)

OVERALL VIDEO IF RESPONSE CHECK

Adjust bias potentiometer for -6 volts at ungrounded side of C42 for sets using KRK29 tuner. Set bias for -6 volts at point Ⓐ for sets using KRK12B tuner.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8. Direct	High side to point Ⓒ. Low side to tuner chassis for sets using KRK29 tuner. Use very short leads. For sets using KRK12B tuner see step 7 of video IF alignment using VHF-UHF tuner KRK12B.	43MC (10MC Swp)	42.25MC 42.5MC 45.0MC 45.75MC 46.5MC	Any not used locally	High side to point Ⓑ. Low side to chassis.	A8, A9	Adjust sweep generator output for 3 volts peak to peak on scope. Retouch A8 and A9 to obtain response similar to Fig. 5. Do not adjust A10 unless absolutely necessary. If A10 is adjusted too low in frequency the level of the 41.25MC sound carrier will be raised and may cause interference in picture. If A10 is tuned too high the 41.25MC sound carrier will be too low and may cause poor sound in weak signal areas. Remove test equipment and bias supply.

KRK29 TUNER ALIGNMENT

An RF unit which is operative and requires only minor touch-up adjustments will require no presetting of adjustments. Where complete alignment is necessary make the following pre-adjustments:
Pre-set A16 all the way out.
Set channel 7 to 13 oscillator slugs one turn from tight. Adjust A14 so that slug is all the way out.
Disconnect the link from terminals "A" and "B" of L25 and terminate the link with a 39Ω carbon resistor. Connect the potentiometer arm of the bias supply to the AGC terminal on the tuner.
Connect the positive lead to tuner chassis.
Adjust the bias supply to produce -3 volts at AGC terminal of tuner.
Tuner alignment as outlined below requires the use of a heterodyne frequency meter.
The limits of oscillator injection voltage are 3 volts minimum and 5.5 volts maximum measured at point Ⓓ with a VTVM.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9. Direct	High side to point Ⓐ. Low side to chassis.	Not used	43.5MC (400^Mod)	8	Vert. Amp. to point Ⓓ. Low side to chassis.	A17	To be sure that 43.5MC trap is adjusted with zero bias short tuner AGC terminal to ground. Set scope gain to maximum. Adjust signal generator for maximum output. Adjust A17 for MINIMUM 400^ indication on scope. Remove AGC jumper to ground.
10.	RF input of heterodyne frequency meter to end of insulated wire inserted in hole provided for adjustment of A19.	"	Set freq. meter to 227MC	8	Not used	A20, A16	Adjust A18 for -3 volts on VTVM at point Ⓓ. Turn fine tuning control fully clockwise. Adjust A20 for audible beat on frequency meter. Adjust A16 clockwise until beat note just begins to change, then turn one full turn in same clockwise direction. Return fine tuning control to its mid-range positions.

Note: If channel 8 oscillator frequency cannot be reached by adjustment of A20 switch to channel 13 and adjust A21 for channel 13 oscillator frequency, then switch to channel 12 and adjust A22 for channel 12 oscillator frequency. Continue down to channel 8 adjusting proper oscillator trimmer to obtain proper oscillator frequency on each channel. Also, on channel 8, adjust A20 for channel 8 oscillator frequency. Switch to channel 13 and adjust A21 then switch back to channel 8 and adjust A20 again.

11.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point Ⓓ. Low side to chassis.	A33, A19 A34, A35	Set A14 to maximum counter clockwise rotation. Set scope gain to maximum and attenuate generator for minimum input signal which will give usuable pattern on scope. Adjust A33, A19, A34 and A35 for response similar to Fig. 6.
12.	Connect DC probe of VTVM to point Ⓓ. Connect common to chassis. Adjust A18 for -3 volts at point Ⓓ. Readjust A18, A19, A33 and A34 for response similar to Fig. 6. Adjust A35 for maximum gain at mid-point of response curve. Repeat as necessary until proper response is obtained.						
13.		Connect frequency meter as in Step 10.	Not used	Frequency meter to 257MC	13	Not used	A21	Turn fine tuning control fully clockwise. Adjust A21 for audible beat on frequency meter. SLIGHTLY overshoot the adjustment an additional turn in the same direction and then adjust A18 to again obtain an audible beat.
14.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A36, A37	Adjust for response similar to Fig. 6. Turn off generator and check oscillator injection voltage at point Ⓓ using VTVM as in step 12. If A18 required readjustment turn sweep generator back on and recheck channel 13 response. If necessary retouch A36 and A37 to obtain desired response.
15.		Connect frequency meter as in step 10.	Not used	Frequency meter to 227MC	8	Not used	A18	Check for audible beat on frequency meter. If necessary readjust A18 for proper oscillator frequency.
16.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A19, A33 A34, A35	If necessary, retouch A19, A33, A34 and A35 to obtain response similar to Fig. 6. If A33 required adjustment turn off generator and switch back to channel 13 and check oscillator injection voltage as in step 12.
17.	If oscillator injection trimmer (A18) was far off it may be necessary to repeat steps 15 and 16 several times before setting of A18 is obtained.						
18.		Connect frequency meter as in step 10.	Not used	Set freq. meter to 129MC	6	Not used	A26	Set fine tuning control to mid-range position. Adjust A29 for audible beat on frequency meter.

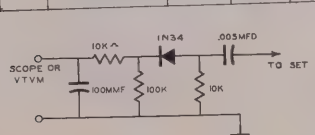


FIG. 1

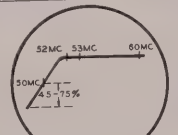


FIG. 2

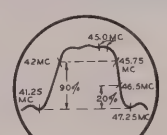


FIG. 3

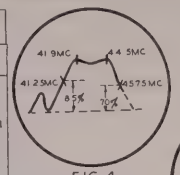


FIG. 4

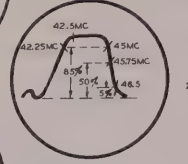


FIG 5

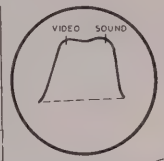


FIG. 6

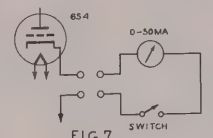


FIG. 7

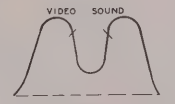


FIG 8A

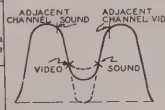


FIG 8B

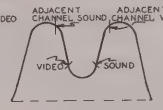


FIG 8C

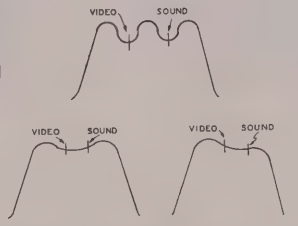


FIG 9

19.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (10MC Swp)	83.25MC 87.75MC	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A38, A29	Adjust for response similar to Fig. 6. Check oscillator injection voltage as above. Also adjust A18 if necessary.
20.	If A18 required adjustment switch receiver and generator to channel 8. Retouch A33 for response similar to Fig. 6. Recheck A16 and A30 for proper oscillator frequency as in Step 10.							
21.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (10 MC Swp)	83.25MC 87.75MC	6	Vert. Amp. to point Ⓓ. Low side to chassis.		Check for response as in Fig. 6. Marker response should not fall below 80% on any channel. Check oscillator injection voltage at point Ⓓ. If markers fall below 80% on response curve retouch A37 and A38 for proper response.
			79MC (10MC Swp)	81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			
22.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response as in Fig. 6. Check oscillator voltage at point Ⓓ. If markers fall below 80% on any channel retouch A19, A33 and A34 for proper response.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
23.		Connect frequency meter as in Step 10	Not used	Freq. meter to 257MC	13	Not used	A21	Adjust individual channel oscillator slug for audible beat on each channel. Recheck oscillator injection voltage on each channel at point Ⓓ to verify that the voltage is within limits (3 volts minimum and 5.5 volts maximum).
				251MC	12		A22	
				245MC	11		A23	
				239MC	10		A24	
				233MC	9		A25	
				227MC	8		A26	
				221MC	7		A27	
				129MC	6		A28	
				123MC	5		A29	
				113MC	4		A30	
				107MC	3		A31	
				101MC	2		A32	

KRK12B VHF TUNER ALIGNMENT

It is necessary to meter the non-oscillating plate current of the 6S4 voltage control tube. This can be accomplished by use of an adaptor or similar arrangement. The circuit diagram for the adaptor is shown in Fig. 7.
Remove the 6S4 from its socket and insert the adaptor plug. Plug 6S4 into the socket.
Connect a 0-50MA meter to adaptor and turn the switch on.
Remove the tuner cover shield.
Set channel selector midway between channels to disable local oscillator. Some tubes may oscillate even with the tuned circuits disengaged.
As a check, short circuit the spring contacts 12 and 13, nearest the tuner front, with a finger (contacts are at zero dc potential). If plate current rises keep finger on contacts while adjusting the oscillator voltage control for 28MA indication on the meter.
Replace tuner shield.
The oscilloscope used should have a sensitivity of 1 millivolt per inch. If sensitivity is less a suitable preamplifier may be used with the scope.
A heterodyne frequency meter is used while making VHF oscillator adjustments.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
24.	Couple loosely to antenna terminals	57MC (20MC Swp)	55.25MC 59.75MC	2	Vert. Amp. to point Ⓒ. Low side to chassis.	A17, A18 A19, A20 (See remarks)	Ground AGC line at tuner terminal board. Turn off adaptor switch removing plate voltage from oscillator. Adjust for response similar Fig. 8B. Do not exceed limits shown in Fig. 8A and 8C. Each channel strip adjustment for an individual channel strip has a corresponding adjustment on all other VHF channel strips. Since these adjustments are identical in position and function they are indicated by the same "A" number in the interests of simplification. Adjustments of A17, A18 and A19 are accessible thru holes in top of tuner as the channel switch is turned to each channel. Adjustment of A20 refers to coupling capacitor whose positioning affects bandwidth of response curve.
		63MC (20MC Swp)	61.25MC 65.75MC	3			
		69MC (20MC Swp)	67.25MC 71.75MC	4			
		79MC (20MC Swp)	77.25MC 81.75MC	5			
		85MC (20MC Swp)	83.25MC 87.75MC	6			
		177MC (20MC Swp)	175.25MC 179.75MC	7			
		183MC (20MC Swp)	181.25MC 185.75MC	8			
		189MC (20MC Swp)	187.25MC 191.75MC	9			
		195MC (20MC Swp)	193.25MC 197.75MC	10			
		201MC (20MC Swp)	199.25MC 203.75MC	11			
		207MC (20MC Swp)	205.25MC 209.75MC	12			
		213MC (20MC Swp)	211.25MC 215.75MC	13			
25.	Turn off the sweep generator and remove the scope from point Ⓒ. Turn the AGC control fully clockwise. Remove the ground placed on the AGC line in the above step. Connect the potentiometer arm of the bias supply to the tuner AGC terminal. Connect the positive lead to the tuner case. Adjust for a -3.5 volts at AGC terminal. Connect the potentiometer arm of a second bias supply to point Ⓐ. Connect the positive lead to chassis. Adjust for a -5 volts at point Ⓓ. Turn on the 6S4 adaptor switch to apply plate voltage to the oscillator. Connection for the heterodyne frequency meter for oscillator adjustments is made as follows: Insert the end of an insulated piece of wire into either of two holes next to the oscillator tube at the right top front corner of the tuner. Use care so that the wire does not touch any tuned circuits. Connect other end of wire to RF input of frequency meter.							

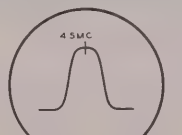


FIG. 10

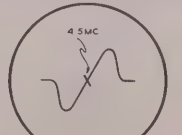


FIG. 11

ALIGNMENT INSTRUCTIONS (cont)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
26.		Connect frequency meter as in step 25.	Not used	Freq. meter to 257MC	13	Not used	A21	Set fine tuning control to its mid-range position. Adjust for audible beat on freq. meter.
27.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	213MC (20MC Swp)	211.25MC 215.75MC	"	Vert. Amp. to point (B). Low side to chassis (Use 3 - 5 volts peak to peak on scope)	A16, A19	Adjust A16 for maximum gain on scope. Adjust A19 for maximum gain and flat topped curve. Recheck A16 for maximum gain at center of band.
28.		Connect frequency meter as in step 25.	Not used	Freq. meter to 251MC	"	Not used	A21, A19	Adjust A21 on each channel for audible beat. Connect sweep generator and scope as in step 27. Set sweep and marker to proper frequencies (See chart) for each channel and ajust A19 if necessary, for maximum gain and proper response.
				245MC	12			
				239MC	11			
				233MC	10			
				227MC	9			
				221MC	8			
				129MC	.7			
				123MC	6			
				113MC	5			
				107MC	4			
				101MC	3			
29.	Direct	High side to point (D). Low side to chassis.	Not used	43.5MC (400∿Mod)	Any	Vert. Amp. to point (B). Low side to chassis.	A22	Adjust for MINIMUM 400∿ indication on scope.

KRK12B UHF TUNER ALIGNMENT

Alignment of the UHF portion of the tuner should not be attempted unless the following test equipment is available, in addition to the usual VHF test equipment: a UHF sweep generator covering the frequency range of 470MC to 890MC. A marker generator of crystal accuracy covering the same frequency range.
Leave the 6S4 adaptor connected as under KRK12B VHF tuner alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
30.	10DB Attenuator Pad	Thru attenuator pad to antenna terminals. Connect UHF marker generator loosely to antenna terminals.	Set sweep to cover channel being aligned (see chart) Use 20MC Sweep width	Set to video & sound frequency of channel being aligned	14 thru 83	Vert. Amp. to point (C). (Thru preamp if necessary). Low side to chassis.	A23, A18, A19	Turn off adaptor switch removing plate voltage from oscillator. Ground the AGC line at the tuner terminal board. Adjust for maximum gain, symmetrical response curve centered about the pass band. See Fig. 9 for acceptable variations.
30.	Connect both bias supplies and adjust as in step 25. Remove the ground from the AGC line. Turn the adaptor switch on to apply plate voltage to the oscillator. Connect the VHF signal generator to point (C) using very short leads. Set generator to 45.75MC for remainder of tuner alignment.							
32.	10DB Attenuator Pad	Thru attenuator pad to antenna terminals. Connect UHF marker generator loosely to antenna terminals.	Set sweep to cover channel being aligned (see chart). Use 20MC swp width	Set to video carrier freq. of channel being aligned	14 thru 83	Vert. Amp. to point (B). Low side to chassis. (Use 3 to 5 volts peak to peak on scope)	A21	Adjust A21 for channel strip being aligned until 45.75MC and video carrier marker coincide on response curve. Adjust A19 of channel strip being aligned for maximum gain with proper wave shape. Connect VTVM to point (C). Common to chassis. Set oscillator injection adjustment for reading on VTVM between .1 volt and .3 volt on all channels.

SOUND IF ALIGNMENT

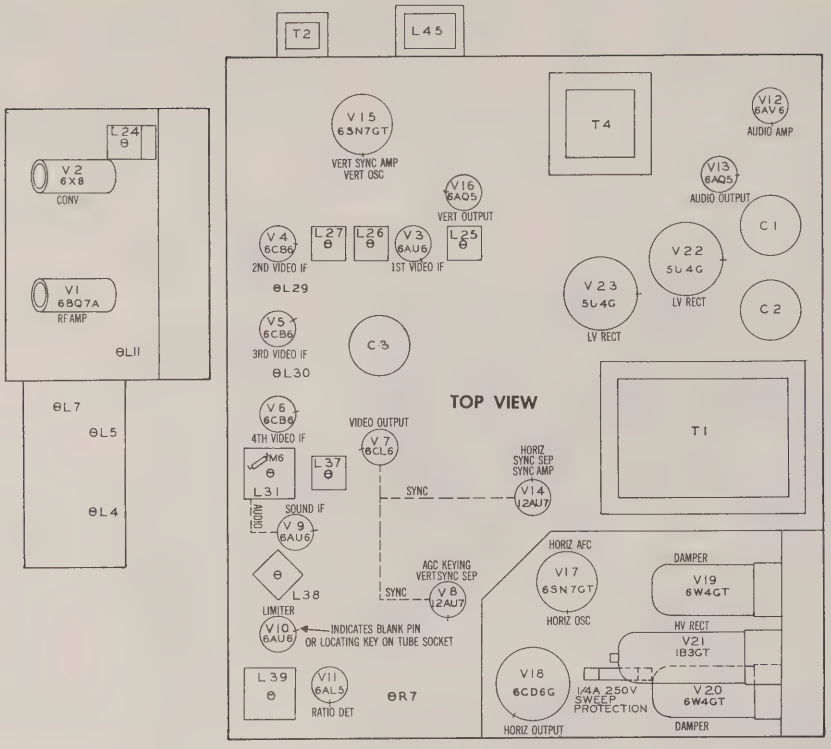
Turn volume control to maximum.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
33.	.001MFD	High side to pin 1 (grid) of 6AU6 (V10). Low side to chassis.	Not used	4.5MC (400∿Mod)	Any	Use VTVM. DC probe to point (E). Common to chassis.	A40	Adjust for maximum deflection. Adjust generator output to maintain 10 volts at VTVM.
34.	"	"	"	"	"	Connect scope across voice coil. VTVM DC probe to point (E). Common to chassis.	A41	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Then adjust A41 to the nearest 400∿ indication on the scope.
35.	Repeat adjustments of A40 for maximum deflection and A41 for minimum audio output with final adjustment of an input level to produce 10 volts at VTVM at point (E).							
36.	Check voltage of point (F). If in excess of ± 1.5 volts adjust the ratio detector balance control, R7, for zero DC. Readjust A41 for minimum audio output. Repeat adjustments of R7 and A41 until voltage at point (F) is less that ± 1.5 volts when A41 is set for minimum audio output.							
37.	Repeat steps 33 and 35.							
38.	.001MFD	High side to pin 1 (grid) of 6AU6 (V9). Low side to chassis.	4.5MC (1MC Swp)	4.5MC	Any	Vert. Amp. thru 10KΩ to point (G). Low side to chassis	A42, A43	Adjust for curve of maximum amplitude and symmetry as in Fig. 10. Attenuate generator to maintain 2 volts peak to peak response. Connect scope to point (F). and check linearity of response similar to Fig. 11.
39.	1000Ω Carbon Resistor	High side to terminal "C" of L37. Low side to chassis.	Not used	4.5MC		Use VTVM. DC probe thru detector (Fig. 1) to pin 6 (plate) of 6CL6 (V7). Common to chassis.	A44	Adjust signal generator approximately .5 volt input. Short pin 1 (grid) of V6 to ground. Adjust A44 for MIMINUM deflection. Remove short from pin 1 of V6.

TELEVISION CHANNEL FREQUENCIES

Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier
2	54-60	55.25	59.75
3	60-66	61.25	65.75
4	66-72	67.25	71.75
5	76 82	77 25	81 75
6	82 88	83 25	87 75
7	174 180	175 25	179 75
8	180 186	181 25	185 75
9	186 192	187 25	191 75
10	192 198	193 25	197 75
11	198 204	199 25	203 75
12	204 21	205 25	209 75
13	212 218	211 25	215 75
14	470 476	471 25	475 75
15	476 482	477 25	481 75
16	482 488	483 25	487 75
17	488 494	489 25	493 75
18	494 500	495 25	499 75
19	500 506	501 25	505 75
20	506 512	507 25	511 75
21	512 5 8	513 25	517 75
22	518-524	519 25	523 75
23	524-530	525 25	529 75
24	530-536	531 25	535 75
25	536 542	537 25	541 75
26	542 548	543 25	547 75
27	548 554	549 25	553 75
28	554 560	555 25	559 75
29	560-566	561 25	565 75
30	566 572	567 25	571 75
31	572 578	573 25	577 75
32	578 584	579 25	583 75
33	584 590	585 25	589 75
34	590 596	591 25	595 75
35	596 602	597 25	601 75
36	602 608	603 25	607 75
37	608 614	609 25	613 75
38	614 620	615 25	619 75
39	620 626	621 25	625 75
40	626 632	627 25	631 75
41	632 638	633 25	637 75
42	638 644	639 25	643 75
43	644-650	645 25	649 75
44	650-656	651 25	655 75
45	656-662	657 25	661 75
46	662 668	663 25	667 75
47	668 674	669 25	673 75
48	674 680	675 25	679 75
49	680 686	681 25	685 75
50	686 692	687 25	691 75
51	692 698	693 25	697 75
52	698 704	699 25	703 75
53	704 710	705 25	709 75
54	710 716	711 25	715 75
55	716 722	717 25	721 75
56	722 728	723 25	727 75
57	728 734	729 25	733 75
58	734 740	735 25	739 75
59	740 746	741 25	745 75
60	746 752	747 25	751 75
61	752 758	753 25	757 75
62	758 764	759 25	763 75
63	764 770	765 25	769 75
64	770-776	771 25	775 75
65	776-782	777 25	781 75
66	782 788	783 25	787 75
67	788-794	789 25	793 75
68	794 800	795 25	799 75
69	800-806	801 25	805 75
70	806 812	807 25	811 75
71	812 818	813 25	817 75
72	818 824	819 25	823 75
73	824 830	825 25	829 75
74	830 836	831 25	835 75
75	836 842	837 25	841 75
76	842 848	843 25	847 75
77	848 854	849 25	853 75
78	854 860	855 25	859 75
79	860-866	861 25	865 75
80	866 872	867 25	871 75
81	872-878	873 25	877 75
82	878 884	879 25	883 75
83	884 890	885 25	889 75

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V22, V23**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V7, V24**
Has pic, no sound - **V9, V10, V11, V12, V13**
Overloaded picture - **V8, V12**

SYNC FAILURE
No vert. sync - **V8, V14, V15**
No horiz. sync - **V14, V17**
No vert. or horiz. sync - **V14**

SWEEP FAILURE
No raster, has sound - **V17, V18, V19, V20, V21, V24, Fuse (M1)**
No vertical deflection - **V15, V16**
Poor vert. linearity or foldover - **V15, V16**
Poor horiz. linearity or foldover - **V17, V18, V19, V20**
Narrow picture - **V17, V18, V19, V20, V21, V22, V23**
Vert. off freq. - **V8, V14, V15**
Horiz. off freq. - **V14, V17**

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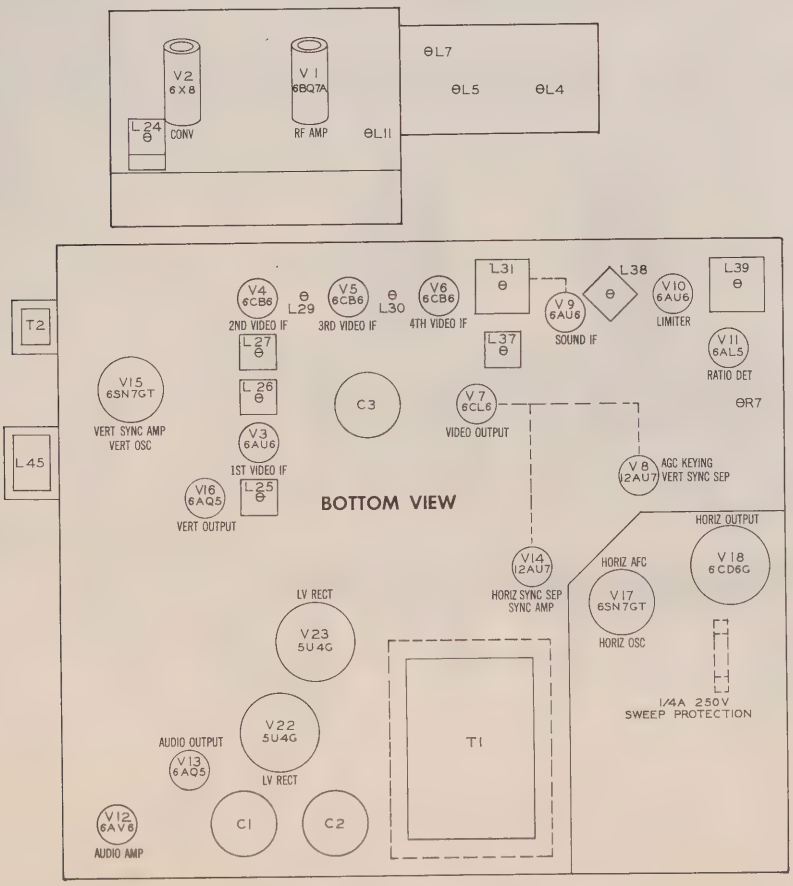
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	† 2.1KΩ	520KΩ	620KΩ	0Ω	.1Ω	620KΩ	600KΩ	120Ω	0Ω
V 2	6X8	0Ω	100KΩ	† 13.1KΩ	0Ω	.1Ω	0Ω	100KΩ	† 16.1KΩ	† 16.1KΩ
V 3	6AU6	83KΩ	0Ω	0Ω	.1Ω	† 16.6KΩ	† 34KΩ	100Ω		
V 4	6CB6	83KΩ	56Ω	0Ω	.1Ω	† 2.1KΩ	† 34KΩ	0Ω		
V 5	6CB6	.2Ω	68Ω	.1Ω	0Ω	† 5.3KΩ	† 13.1Ω	0Ω		
V 6	6CB6	.2Ω	180Ω	.1Ω	0Ω	† 7.9KΩ	† 12.2K	0Ω		
V 7	6CL6	33Ω	3.9KΩ	† 20.1KΩ	0Ω	.1Ω	† 6.2KΩ	0Ω	† 20.6KΩ	3.9KΩ
V 8	12AU7	360KΩ	4Meg	† 4.3KΩ	.1Ω	.1Ω	† 680KΩ	4.7Meg	0Ω	0Ω
V 9	6AU6	470KΩ	0Ω	0Ω	.1Ω	§ 1KΩ	§ 1KΩ	82Ω		
V 10	6AU6	47KΩ	0Ω	0Ω	.1Ω	§ 1KΩ	§ 22KΩ	0Ω		
V 11	6AL5	7.8KΩ	7.8KΩ	.1Ω	0Ω	INF	0Ω	INF		
V 12	6AV6	10Meg	0Ω	0Ω	.1Ω	600KΩ	600KΩ	† 330KΩ		
V 13	6AQ5	§ 470KΩ	7.3KΩ	0Ω	.1Ω	† 770Ω	† 370Ω	§ 470KΩ		
V 14	12AU7	† 6.2KΩ	† 33KΩ	400KΩ	.1Ω	.1Ω	† 13.3KΩ	61KΩ	0Ω	0Ω
V 15	6SN7GT	1.2Meg	† 37.3KΩ	15KΩ	1.6Meg	¶ 950KΩ	130Ω	0Ω	.1Ω	
V 16	6AQ5	3.3Meg	1.7KΩ	0Ω	.1Ω	† 660Ω	† 660Ω	3.3Meg		
V 17	6SN7GT	1.2Meg	† 45KΩ	250KΩ	260KΩ	† 68KΩ	0Ω	0Ω	.1Ω	
V 18	6CD6G	INF	.1Ω	110Ω	INF	1Meg	110Ω	0Ω	† 12KΩ	TOP CAP ¶ 15Ω
V 19	6W4GT	INF	INF	340KΩ	INF	† 57Ω	INF	INF	INF	
V 20	6W4GT	INF	340KΩ	340KΩ	INF	† 57Ω	INF	INF	INF	
V 21	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ¶ 290Ω
V 22	5U4G	INF	11KΩ	INF	11Ω	INF	11Ω	INF	11KΩ	
V 23	5U4G	INF	11KΩ	INF	11Ω	INF	11Ω	INF	11KΩ	
V 24	21AP4	0Ω	† 220KΩ	PIN 10 ¶ 270KΩ	PIN 11 † 130KΩ	PIN 12 .1Ω				

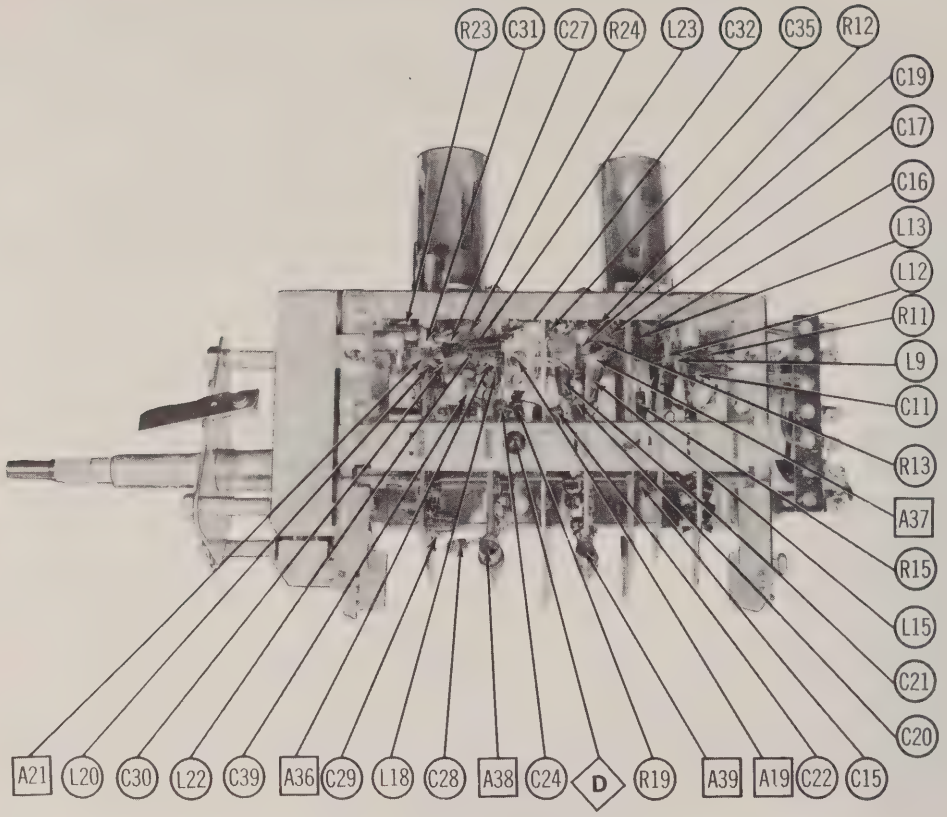
† MEASURED FROM PIN 2 OF V23.
§ MEASURED FROM 135V lines.
¶ MEASURED FROM PIN 3 OF V19.



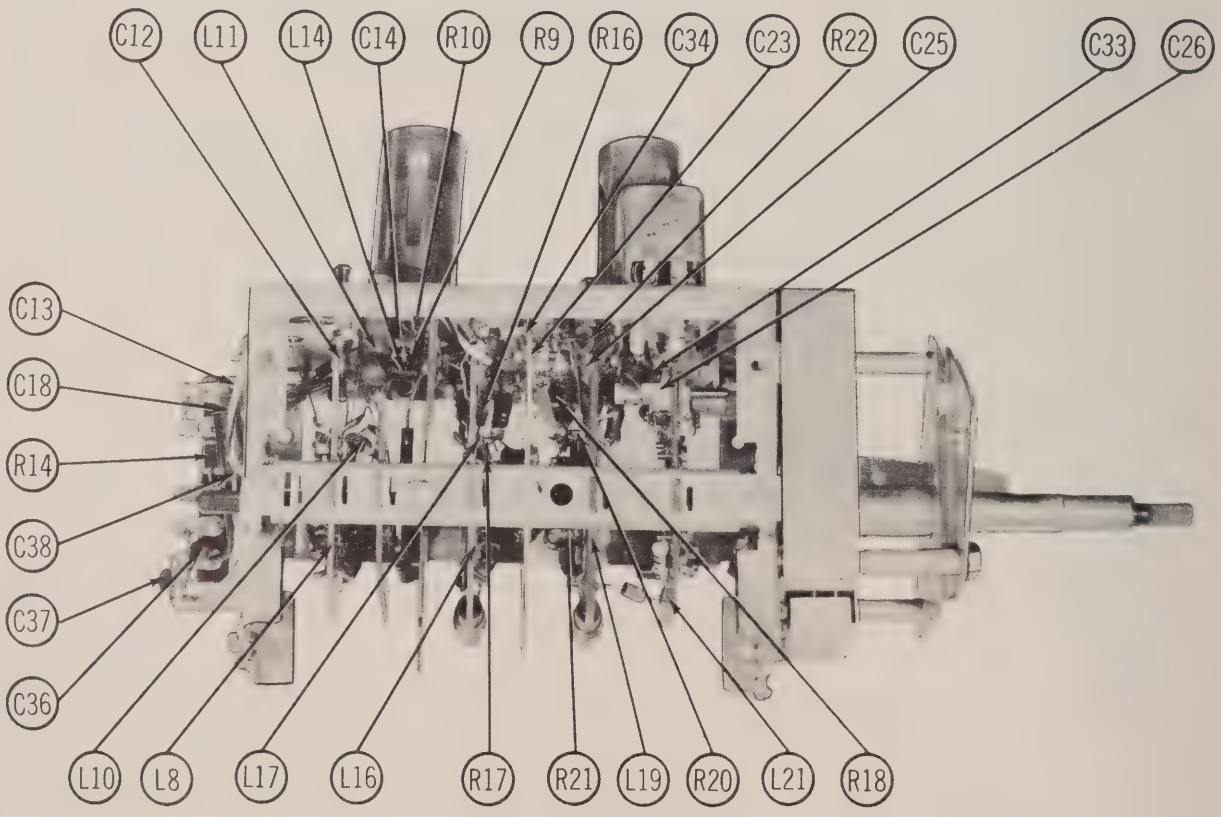
TUBE PLACEMENT CHART

SET 230 FOLDER 8

RCA VICTOR MODELS 21-D-358, U, 21-D-368, U, 21-D-377, U, 21-D-378, U, 21-D-379, U, 21-D-380, U (Ch. KCS81F, J)

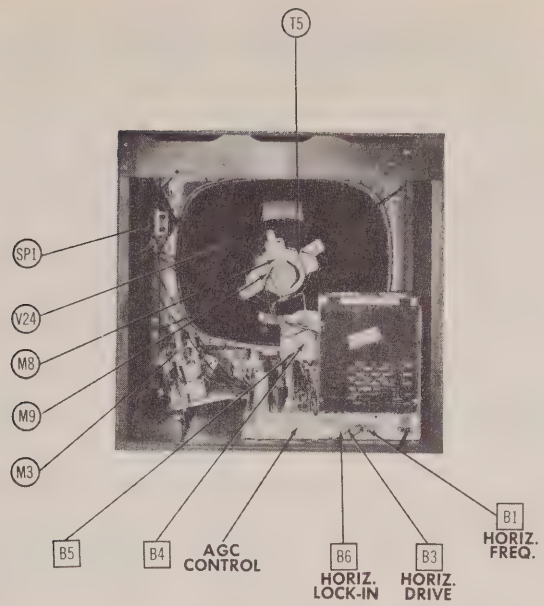


RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

PROPERTY OF
[illegible]SHIP
[illegible] MEMPHIS ST.
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station preferably a test pattern. If the picture cannot be synchronized horizontally with the horizontal hold control, adjust the horizontal frequency slug (B1) until picture will synchronize. If picture still will not synchronize, adjust the horizontal waveform slug (B2) several turns out of the coil and readjust B1 to synchronize the picture. If picture width or linearity is incorrect adjust the horizontal drive trimmer (B3) the width control slug (B4) and the horizontal linearity control slug (B5) for proper results.

HORIZONTAL WAVEFORM ADJUSTMENTS

The horizontal waveform adjustment is made at the factory and normally will require no adjustment. B1 and B2 are adjusted simultaneously while watching the picture.

Set the horizontal hold control fully clockwise. Turn B1 until picture falls out of sync and one diagonal bar sloping down to the right appears on the screen.

Turn B2 clockwise, at the same time adjusting B1 to maintain one diagonal bar on the screen.

Continue adjusting B1 and B2 in that manner until the oscillator begins to motorboat, then adjust B2 counter clockwise until motorboating stops.

To check adjustment turn B1 until picture synchronizes, then reverse the direction until picture falls out of sync with the diagonal bar sloping down to the right. Continue to turn B1 in the same direction. No additional bars should appear on the screen. Instead, the horizontal oscillator should start to motorboat.

Retouch B2 until this condition is obtained. To observe the horizontal waveform connect the low capacity probe of an oscilloscope to terminal "C" of L40. Turn horizontal hold control 1/4 turn from clockwise so that picture is in sync. The waveform on the scope should appear as in Fig. 12. Adjust B2 for broad and narrow peaks of equal height as in Fig. 12.

If necessary, while adjusting B2 keep the picture in sync with the horizontal hold control. Remove the oscilloscope.

HORIZONTAL LOCKING RANGE ADJUSTMENT

With the horizontal hold control in full counter clockwise position momentairly interrupt the signal by switching off channel and back. If picture remains in sync turn B1 slightly and again switch off channel, repeating until picture loses sync with diagonal bars sloping down to the left.

Slowly turn the horizontal hold control clockwise and note the least number of bars obtained just before the picture pulls into sync. If the number is more than 3 adjust the horizontal locking trimmer (B6) slightly clockwise. If the number is less than 2 adjust B6 slightly counter clockwise. Recheck as above for the least number of bars and readjust B6, if necessary, until 2 or 3 bars are present.

Turn the horizontal hold control fully clockwise and adjust B1 until the diagonal bar sloping down to the right appears on the screen, then reverse direction of adjustment of B1 until the diagonal bar just disappears, leaving the picture in synchronization.

FM TRAP ADJUSTMENT

If interference from a strong FM station is encountered adjust A45 (on top of antenna matching transformer) for minimum interference in the picture.

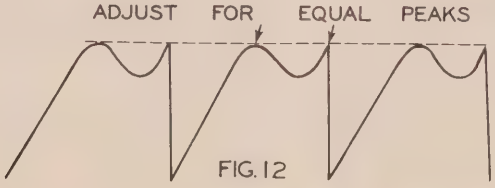


FIG. 12

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V17, V18, V19, V20, V22 and V23. Check adjustments B3, B4 and B5. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check T3, T5A, C118, C119, C113, R129, R130 and other associated components.	Check C109, C110, C111, C112, R120, R123, R126 and other associated components.

DRIVE LINES

Check adjustment B3. Check by substitution V17, V18, V19, and V20. Check components associated with these stages especially C118, C119, C113, C109, C110, C111, C112, T3, T5A, R120, R123, R126 and L40.

COMPRESSED LEFT SIDE

Check by substitution V17, V18, V19 and V20. Check adjustments B3, V4 and B5. Check width coil by removing width link. Check components associated with the horizontal output and damper stages especially T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

XMAS TREE EFFECT

Substitute V17. Check adjustments B1 and B2. Check L40, C109, C110, C112 and other components associated with V17.

VERTICAL

LOSS OF SWEEP

Check by substitution V15 and V16. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B and other associated components.	Check C92, C93, R104, R107 and other associated circuit components.

INSUFFICIENT SWEEP

Check by substitution V15 and V16. Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT TOP

Check by substitution V15 and V16. Check T4, T5B, C2D and other associated circuit components.

COMPRESSED AT BOTTOM

Check by substitution V15 and V16. Check T4, T5B, C92, C93 and other associated circuit components.

FOLDS

Substitute V15 and V16. Check components associated with V15B and V16.

SYNC

LOSS OF HORIZONTAL AND VERTICAL SYNC

Check by substitution V8 and V14. Check components associated with these stages.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V8, V14 and V15. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check components associated with V15B.	Check vertical integrator network and other components associated with V8 and V14.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V14 and V17. Check associated circuit components especially components associated with V17B.

HORIZONTAL BENDING

Check V17 and V18 for heater to cathode leakage. Check filament circuit of these stages for filament lead shorts. Check sync section for 60 cycle modulation. Check horizontal AFC filter network components for failure or change of value.

VIDEO

LOSS OF VIDEO

Substitute V7. Check associated circuit components. Check picture tube.

SOUND BARS (4.5MC BEAT)

Check adjustment of fine tuning. Check 4.5MC trap L34. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check video detector crystal and assembly. Check associated circuit components for failure or change of value.

NEGATIVE PIX

Substitute V7 and V8. Check adjustment of the AGC control. Check video detector crystal and assembly. Check picture tube and other associated circuit components.

SMEAR

Substitute V7. Check video detector crystal and assembly. Check C58, L32, L35, L36, R51, R54, R55, contrast control, picture tube and other associated components for failure or change of value,

WIDE BLACK BAR ACROSS PIX

Check V1, V2, V3, V4, V5, V6 and V7 for heater to cathode leakage. Check B+ filter capacitors for open. Check filter choke in B+ power supply for shorted winding.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10, V11, V12 and V13. Check stages of V12 and V13 using audio signal generator. Apply audio signal across R70.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V12 and V13.

BUZZ

Adjust A41 for minimum buzz. If buzz is still objectionable, substitute V11 and realign audio IF and ratio detector. Follow procedure outlined in the alignment section. Check C6, C69 and C70. Check adjustment of fine tuning. Check video IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

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L. F. BLANKENSHIP
3974 MEADE ST
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7A	6BQ7A	9AJ	
V2	Converter	6X8	6X8	9AK	
V3	1st Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	4th Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	6CL6	6CL6	6CL6	
V8	AGC Keying - Vert. Sync Sep. -	12AU7	12AU7	9A	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Limiter	6AU6	6AU6	7BK	
V11	Ratio Detector	6AL5	6AL5	6BT	
V12	AF Amplifier - AGC Clamper	6AV6	6AV6	7BT	
V13	Audio Output	6AQ5	6AQ5	7BZ	
V14	Horiz. Sync Sep. - Sync Amplifier	12AU7	12AU7	9A	
V15	Vert. Sync Amp. - Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V16	Vert. Output	6AQ5	6AQ5	7BZ	
V17	Horiz. AFC Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6CD6G	6CD6G	5BT	
V19	Damper	6W4GT	6W4GT	4CG	
V20	Damper	6W4GT	6W4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4G	5U4G	5T	
V23	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: RCA Victor PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V24	21AP4	21AP4	21AP4		12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲35	450		AFH4-16		DO15		FP445	TVL-4771	
B	5	450								Note 1
C	■35	450								
D	▲10	450								
C2A	▲35	450	76486	AFH4-83		D104		FC437	TVL-4714	
B	■25	450						TC74		
C	▲20	200								
D	100	50								
C3A	▲70	450	77657	AFH4-16		DO15		FP450		
B	■10	450		PRS450/10		BR1045			TVL-4780	
C	▲10	450								
D	5	450								
C4	5	450	28417	PRS450/4		BR445		TC70	TVA-1702	
C5	5	250		PRS250/4		BR425		TC50X	TVA-1501	Note 1
C6	5	50	74521	PRS150/4		BR550		TC30	TVA-1303	
C7	18		74207							
C8	5		93056	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C9	27		70935							
C10	33		76739	SI33NP0	TCZ-33		NP0K-330	ZT-5433	5TCC-Q33	
C11	270		75199	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C12	1-4				829-4			CT551		
C13	1000		77084	EF-001	MFT-1000				503C-D1	
C14	1000		77252	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C15	270		75199	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C16	1000		77252	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C17	1000		77252	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C18	10000		73960	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C19	.8-3				829-3			CT565A		
C20	2.2		71502	SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C21	150		78276	SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C22	270		75199	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C23	1000		77084	EF-001	MFT-1000				503C-D1	
C24	3.3		71503	SI3.3NP0	TCZ-3.3		NP0K-3R3		5TCCB-V33	
C25	.8-3		77151		829-3			CT565A		
C26	.8-3		77913		829-3			CT565A		
C27	10		78247	SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C28	.7		71504							
C29	10		77865	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C30	10		77865	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C31	.8-3		77151		829-3			CT565A		
C32	1000		77084	EF-001	MFT-1000				503C-D1	
C33	1000		77252	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C34	1000		77084	EF-001	MFT-1000				503C-D1	
C35	1000		77084	EF-001	MFT-1000				503C-D1	
C36	470		77293	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C37	470		77293	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	Note 2
C38	470		77293	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	Note 2
C39	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C40	4700		73473	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C41A	4700		76470	BPD-2X0047	DD2-502	TM5DD5	822-005	DCD-525	5HK-2D47	
B	4700									
C42	.22	200	73794	P488-22		PTE4P22		PT4025	4TM-P22	
C43	.22	200	73794	P488-22		PTE4P22		PT4025	4TM-P22	
C44	4700		73473	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C45	.1	400	73551	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C46	4700		73473	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C47A	4700		76470	BPD-2X0047	DD2-502	TM5DD5	822-005	DCD-525	5HK-2D47	
B	4700									
C48	4700		73473	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	

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PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
			REPLACEMENT DATA							
C48A	4700		76470	BPD-3X0047	DD3-502	TM5DD5	832-005	DCD-525	5HK-3D47	
B	4700									
C50	4700		73473	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C51	1500		75196	CS-1B-0015					501C-D15	
C52	4700		73473	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C53A	4700		76470	BPD-3X005	DD3-502	TM3DD5	833-005	DCD-535	5HK-3D47	
B	4700									
C54	10000		73980	BPD-01	DD-103	TM5D1	811-01	DC-511	5HK-51	
C55	.0082	400	72808							
C56	47		3N47NP0	TCS-47			NP0K-470	ZT-5447	5TCC-Q47	
C57	15		3N15NP0	TCS-15			NP0K-150	ZT-5415	5TCC-Q15	
C58	.22	400	73794			PTK4P22		PT4025	4TM-P22	
C59	1500		73748	BPD-0015	DD-152	TM3D15	801-0015	DC-5315	5HK-D15	
C60	.39	3500	76574							
C61	220	1000	75248							
C62	.0027	600	73599							
C63	.22	200	73794	P488-22		PTK4P22		PT4025	4TM-P22	
C64	.22	200	73794	P488-22		PTK4P22		PT4025	4TM-P22	
C65	10000		73980	BPD-01	DD-103	TM5D1	811-01	DC-511	5HK-51	
C66A	10000		76877	BPD-3X01	DD3-103	TM3D51	811-01	DCD-511	5HK-3S1	
B	10000						811-01			
C67	58		71394	5Z56	D6-560		GP1K-560	UC-5456	5GA-Q56	
C68A	10000		76877	BPD-3X01	DD3-103	TM3D51	811-01	DCD-511	5HK-3S1	
B	10000						811-01			
C69	470	500	39644	1469-0005		SR5T5			MS-35	
C70	470	500	39644	1469-0005		SR5T5			MS-35	
C71	.0022	600	73595	P688-0022	D6-322	PTK6D22	GP2-333-222	PT6222	6TM-D22	
C72	.0047	600	73920	P688-0047	D6-472	PTK6D47	GP2-333-472	PT6247	6TM-D47	
C73	.023	200	73563	P488-023	DF-203	PTK4S23		PT4123	4TM-S23	
C74	.01	400	73561	P488-01	D6-103	PTK4S1	GP2-333-103	PT411	4TM-S1	
C75	.0027	600	73599							
C76	270		47617	5Z70	D6-271		GP2K-271	UC-5327	5GA-T27	
C77	.01	400	73561	P488-01	D6-103	PTK4S1	GP2-333-103	PT411	4TM-S1	
C78	.0027	600	73599							
C79	330	500	39640	1469-00035						
C80	.047	400	73553	P488-047	DF-503	PTK4S47		PT4147	4TM-S47	
C81	270	500	39638	1469-0003		SR5T3			MS-33	
C82	.033	400	73552	P488-033						
C83	.0068	400	73789	P688-0068	D6-682	PTK6D68	GP2-333-682	PT6268	6TM-D68	
C84	.0047	400	73920							
C85	.0082	400	[illegible]							
C86	270	1000	47617							
C87	.01	400	73561	P488-01	D6-103	PTK4S1	GP2-333-103	PT411	4TM-S1	
C88	100		39396	SL100N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C89	100		39396	SL100N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C90	100		39396	SL100N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C91	.0047	600	73920	1464-005		DR8D5			MS-35	
C92	.1	600	73557							
C93	.22	600	74857	584-35		PTK6P25		PT6025	6TM-P25	
C94	.0022	600	73803	P688-0022	D6-222	PTK6D22	GP2-333-222	PT6222	6TM-D22	
C95	.022	400	73562	P488-022		PTK4S22		PT4122	4TM-S22	
C96	.022	400	73562	P488-022		PTK4S22		PT4122	4TM-S22	
C97	.1	600	73557	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C98	.022	600	73796	P688-022	DF-203	PTE6S22		PT6122	6TM-S22	
C99	.1	400	73551	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C100	.22	400	73794	P488-22		PTE4P22		PT4025	4TM-P22	
C101	.0047	400	73920	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C102	120		71614	SU120	D6-121	TM5T12	GP1K-121	UC-5312	5GA-T12	
C103	82	500	76474							
C104	.047	600	73553	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C105	82	500	76474							
C106	.47	200	73787	P288-47		PT2P5		PT405	2TM-P47	
C107	.022	400	73562	P488-022	DF-203	PTE4S22		PT4123	4TM-S22	
C108	.047	400	73553	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C109	270	500	76579	1465-0003						
C110	.01	600	73594							
C111	.0013	600	77727							
C112	.001	1000	75543	P1088-001		PTE16D1		PT1621	MB-D1	
C113	.047	600	73593	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C114	.47	200	73787	P288-47		PT2P5		PT405	2TM-P47	
C115	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C116	33	6000	76577	EVD60-000033					76GA-Q33	
C117	150	2000	76576	EVD30-00015					20GA-T15	
C118	.068	1000	73815							
C119	.068	1000	73815							
C120	500	30000	76488							
C121	180	3500	76575							
C122	56									
C123	10									
C124	.01	600	73594	582ZX-01		PJ581		PT611	6TM-S1	
C125	.01	600	73594	582ZX-01		PJ581		PT611	6TM-S1	

Note 1. When C1B is 10MFD, C5 is not used (part #76485 when C1B is 10MFD)
Note 2. Not used in Ch. KC881J

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
			REPLACEMENT DATA					
R1A	850KΩ	½	77652	QJ-137	AG-51-S	AB-59	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2A	2.5MEG	½	77640	QU-239	AG-84-S	AB-83	U-255	Height
B	Shaft		Not Req.	SQ	KSS-3	AK-1	Not Req.	Attach to R2A
R3A	1500Ω	½	77653	QU-110	AG-11-S	AB-6	U-6	Vert. Linearity
B	Shaft		Not Req.	SQ	KSS-3	AK-1	Not Req.	Attach to R3A
R4A	75KΩ	½	77839	QU-129	AG-47-S	AB-35	U-41	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R4A
R5	15KΩ	½	76445	QU3-11EXX				Contrast tapped at 4875Ω & 10K
R6A	200KΩ	½	77655	* QJ-496			UF254L	Brightness (panel)
B	1MEG	½	Not Req.				UR16-T25	Volume (Rear) tapped at 200K
C	Switch		Not Req.				US-27	Attach to R5B
R7	2500Ω	½	77799					Ratio Detector balance
R8A	200KΩ	½	77654	QU-129	AG-52-S	AB-46	U-43	AGC
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A

* CONCENTRIKIT EQUIVALENT KIT-K3 BASE ELEMENTS & SHAFTS B11-129 & P1-200 (Panel B13-137X + R1-216 (Rear) & SWITCH 76-2.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R9	6800Ω	½		BTS-6800	
R10	120Ω	½	503112	BTS-120	
R11	100KΩ	½		BTS-100K	
R12	1MEG	½		BTS-1MEG	
R13	1MEG	½		BTS-1MEG	
R14	470Ω	½		BTS-470	
R15	1000Ω	½		BTS-1000	
R16	1000Ω	½		BTS-1000	
R17	39Ω	½		BTS-39	
R18	100KΩ	½		BTS-100K	
R19	100KΩ	½		BTS-100K	
R20	15Ω	½		BTS-15	
R21	3300Ω	½		BTS-3300	
R22	15KΩ	2		BTS-15K	
R23	100KΩ	½		BTS-100K	
R24	12KΩ	½		BTS-12K	
R25	1000Ω	½	503210	BTS-1000	
R26	1000Ω	½	503210	BTS-1000	Note 3
R27	100Ω 5%	½	503110	BTS-100 5%	
R28	33KΩ	½	503323	BTS-33K	
R29	1000Ω	½	503110	BTS-1000	
R30	33KΩ	½	503323	BTS-33K	
R31	1000Ω	½	503110	BTS-1000	
R32	56Ω 5%	½	503056	BTS-56 5%	
R33	33KΩ	½	503323	BTS-33K	
R34	1000Ω	½	503110	BTS-1000	
R35	5600Ω 5%	½	502256	BTS-5600 5%	
R36	68Ω	½	503068	BTS-68	
R37	10Ω	½		BTS-10	Note 1
R38	10KΩ	½	503310	BTS-10K	
R39	2200Ω	½	503222	BTS-2200	
R40	56KΩ 5%	½	503256	BTS-56K 5%	
R41	180Ω	½	503118	BTS-180	
R42	8200Ω	½	503282	BTS-8200	
R43	18KΩ	½	503318	BTS-18K	
R44	6800Ω	1	513268	BTA-6800	
R45	470KΩ	½	503447	BTS-470K	
R46	3900Ω 5%	½	502239	BTS-3900 5%	
R47	33Ω	1	563033	BTS-33	
R48	240Ω 5%	1		BTA-240 5%	Note 2
R49	4700Ω	1	502247	BTA-4700	
R50	15KΩ	1	513315	BTA-15K	
R51	6750Ω	10	76642		
R52	5600Ω	1	513256	BTA-5600	
R53	10KΩ	1	513310	BTA-10K	
R54	150KΩ	1	503415	BTA-150K	
R55	470KΩ	1	503447	BTS-470K	
R56	1000Ω	1	503210	BTA-1000	
R57	100KΩ	1	503410	BTA-100K	Note 4
R58	82Ω 5%	1	502062	BTS-82 5%	Note 4
R59	1000Ω	1	503216	BTS-1000	
R60	47KΩ	1	503347	BTS-47K	
R61	56K Ω 5%	1	503356	BTS-56K 5%	
R62	33KΩ	½	503333	BTS-33K	
R63	1000Ω	1	503210	BTA-1000	
R64	47Ω	1	503047	BTS-47	
R65	39KΩ	½	503339	BTS-39K	
R66	1000Ω	½	503210	BTS-1000	
R67	68000Ω 5%	½	14659	BTS-68000 5%	
R68	6800Ω 5%	½	14659	BTS-6800 5%	
R69	15KΩ	½	503315	BTS-15K	
R70	10Meg	½	503610	BTS-10Meg	
R71	330KΩ	½	503433	BTS-330K	
R72	470KΩ	½	503447	BTS-470K	
R73	330Ω	1	513133	BTA-330	
R74	330Ω	1	513133	BTA-330	
P75	100KΩ	½	503410	BTS-100K	
6	270KΩ	½	502427	BTS-270K	

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R77	10KΩ	½	503310	BTS-10K	
R78	3.6Meg	1	513536	BTA-3.6Meg	
	5%			5%	
R79	2.9Meg	½	503539	BTS-3.9Meg	
R80	270KΩ 5%	½	502427	BTS-270K 5%	
R81	10KΩ	½	503310	BTS-10K	
R82	82KΩ	½	8064	BTS-82K	
R83	4.7Meg	½	503547	BTS-4.7Meg	
R84	680KΩ	½	503468	BTS-680K	
R85	470KΩ	½	503447	BTS-470K	
R86	39KΩ	½	503389	BTS-39K	
R87	22KΩ	½	503322	BTS-22K	
R88	1Meg	½	503510	BTS-1Meg	
R89	220KΩ 5%	½	502422	BTS-220K 5%	
R90	27KΩ	½	503327	BTS-27K	
R91	27KΩ	½	503327	BTS-27K	
R92	270KΩ	½	503427	BTS-270K	
R93	6200Ω	½		BTS-6200	
R94	8200Ω	1	513282	BTA-8200	
R95	220KΩ 5%	½	503422	BTS-220K 5%	
R96	1Meg	½	503510	BTS-1Meg	
R97	1800Ω 5%	½	502218	BTS-1800 5%	
R98	33KΩ	½	503333	BTS-33K	
R99	15KΩ	½	503315	BTS-15K	
R100	100KΩ	½	503410	BTS-100K	
R101	470KΩ	½	503447	BTS-470K	
R102	470KΩ	½	503447	BTS-470K	
R103	1.2Meg	½	503512	BTS-1.2Meg	
R104	470KΩ	½	503447	BTS-470K	
R105	6800Ω 5%	½	14659	BTS-6800 5%	
R106	100KΩ	½		BTS-100K	Note 6
R107	3.3Meg	½	503533	BTS-3.3Meg	
R108	68KΩ 5%	1	512368	BTA-68K 5%	
R109	56Ω	½	503156	BTS-560	
R110	10KΩ	½	503310	BTS-10K	
R111	39KΩ	½	50339	BTS-39K	
R112	56KΩ	½	503356	BTS-56K	
R113	150KΩ	½	503415	BTS-150K	
R114	330KΩ	½	503433	BTS-330K	
R115	750KΩ 5%	1		BTA-750K 5%	Note 5
R116	180KΩ	½	503418	BTS-180K	
R117	68KΩ	½	503368	BTS-68K	
R118	3900Ω	½	503239	BTS-3900	
R119	10KΩ	½	503310	BTS-10K	
R120	39KΩ	½	503339	BTS-39K	
R121	82KΩ	1	513382	BTA-82K	
R122	47Ω	½	503047	BTS-47	
R123	1Meg	½	503510	BTS-1Meg	
R124	2500Ω	2			
R125	220Ω	2			
R126	68KΩ	1	513368	BTA-68K	
R127	390KΩ	½	503439	BTS-390K	
R128	330KΩ	½	503433	BTS-330K	
R129	27KΩ	2	523327	BTS-27K	
R130	22KΩ	2	523322	BTS-22K	
R131	270KΩ	½	503427	BTS-270K	
R132	1.5Ω	3	76468		
R133	3300Ω	2	502233	BTS-3300	
R134	150KΩ	½	503415	BTS-150K	
R135	560Ω	½		BTS-560	
R136	100KΩ	1	513510	BTA-100K	
R137A	600Ω	16	77651		
B	500Ω	6			
C	2000Ω	5			
D	1200Ω	1			
E	10KΩ	5			
F	7000Ω	6			
R138	680Ω	½	503168	BTS-680	

Note 1. Not used in all models.
Note 2. Some models may use a 220Ω resistor in this application.
Note 3. Some models may use a 6800Ω resistor in this application.
Note 4. Some models may use a single 100Ω resistor in this application.
Note 5. Some models may use a 820KΩ resistor in this application.
Note 6. Some models may use a 150KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RCA Victor PART No.	REPLACEMENT DATA STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE NO.
T1	117VAC	846VCT	5VAC	6.3VAC	77649	P-8166①	P-3053①	TP-356		
	② 2.46A	.310ADC	② 6A	② 2.4A			④⑤			
				SEC. 4						
				6.3VAC						
				② 5.8A						

① Parallel 6.3V 5A windings, and use as sec. 4.
④⑤ Use Low voltage secondary tap, tape high voltage taps.
⑥ Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING SEC.	RCA Victor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE NO.	NOTES
			REPLACEMENT DATA						
T2	600Ω tap ② 130Ω		77650						Vert Osc. Trans.
T3	2900Ω tap ③ 8Ω	0Ω	76501 ① 76672 ②						Horiz. Output Trans.
T4	630Ω	.6Ω	76494	A-8140③	A-3080③ ④	T80-6 ③	A-103X ③		Vert. Output Trans.
T5A	25Ω		76276 ⑤						Horiz. Deflection Coils
B	3.5Ω								Vert. Deflection Coils
T6	12Ω		76483		MWC-2④	TW-5	WC-12 ⑦		Horiz. Lin Coil
T7	120Ω		76484						Width Coil

① Does not include filament winding.
② Filament winding only for RI-Voltage trans.
③ Drill new mounting hole.
④ Use 50 to 1 turns ratio.
⑤ Complete with 6 contact male connector, Part No-75543.
⑥ Enlarge mounting hole.
⑦ Connect to coded blue and green terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	RCA Victor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
					REPLACEMENT DATA					
T8	6.5KΩ	3.5Ω	400Ω	.5Ω	76997		A-3878①	A-3019 ①	RO-301 ①	S-5X ①

① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	RCA Victor PART No	VIKING PART No	QUAM PART No.	NOTES
				REPLACEMENT DATA			
SP1A	8"	PM	3.5Ω	75023	579	8A21	① Used in console models.
B	12"	PM	3.5Ω	75093 ①	12J11	12A21	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
				REPLACEMENT DATA				
L1	Ant. Trans.	.6Ω	.6Ω	73591				Complete Ant. Trans. Assembly (Part # 76396-Includes L1 & L2)
L2	Ant. Trans.	.6Ω	.6Ω	73591				
L3	IF Trap	0Ω		76542				Includes core
L4	Ant. Shunt Coil	0Ω		76538				
L5	Ant. Shunt Coil	0Ω		76537				Includes core
L6	IF Trap	0Ω		76541				Includes core
L7	FM Trap	0Ω		76540				Includes core
L8A	Ant. Shunt Coils	0Ω		78398				Includes stator complete with rotor & coils
B	Ant. Coils	0Ω						
L9	Ant. Shunt Coil	0Ω		77859				
L10	Ant. Coil	0Ω		78401				Channel 6
L11	IF Input Coil	.1Ω		78271				Includes core
L12	IF Trap	.3Ω		78466				
L13	FIL. Choke	0Ω		77206				
L14	Neutr. Coil	0Ω		76562				
L15	RF Coil	0Ω		77921				Channel 13; Less core, Core Part # 77914
L16	RF Coils	0Ω		78274				Includes stator complete with rotor, coils, L15, L17, C20, C21, R15, R16 . 47 Microhenry
L17	RF Coil	0Ω		78324				
L18	Mixer grid Coil	0Ω		77919				Channel 13; Less core, Core Part # 77914
L19	Mixer Grid Coils	0Ω		78272				Includes stator complete with rotor, coils, L18, C23, C24, C26, C29, R17, R18, R20, & R22
L20	Osc. Coil	0Ω		77915				Channel 13; Less core, Core Part # 77914
L21	Osc. Coils	0Ω		77919				Includes stator complete with rotor, coils, L20, C26, & C29
L22	Fil. Choke	0Ω		76763				
L23	Fil. Choke	0Ω		76763				
L24	Conv. Plate	.3Ω	.1Ω	78399			6315	Includes 27KΩ resistor
L25	1st Video IF Grid	.2Ω	.3Ω	77198	17-4531		6316	Includes trap and 5.6KΩ resistor
L26	1st Video IF Plate	.1Ω		77197			6317	Includes trap, 4.7KΩ resistor & 100 MMF capacitor
L27	2nd Video IF Grid	.1Ω		76435			6318	Includes trap
L28	Fil. Choke	0Ω		73477	19-3001	TV-180	4804	1.36 Microhenries
L29	3rd Video IF	.3Ω	.2Ω	76433	17-4533		6319	
L30	4th Video IF	.2Ω	.3Ω	76433	17-4533		6319	
L31	5th Video IF	.3Ω	.3Ω	76436				Includes 10KΩ resistor, IN64 crystal detector, 10MMF capacitor, & 36 Microhenries Series Peak. Coil
L32	Series Peak. Coil	5Ω		76646	19-3075 †	TV-186 †	6173 †	73 Microhenries; wound on 3.3KΩ resistor
L33	Shunt Peak. Coil	16Ω		76352	19-3500	TV-188	6174	500 Microhenries

(CONT'D ON NEXT PAGE)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L34	4.5MC Trap	2Ω		76482	20-1004 *	TV-151 *	1470 *	Wound on 47MMF capacitor
L35	Shunt Peak. Coil	16Ω		75252	19-3500	TV-188	6174	500 Microhenries
L36	Series Peak. Coil	7Ω		76647	19-3180 ■	TV-182	6179	180 Microhenries; wound on 22KΩ resistor
L37	1st Sound IF	7Ω (tap @ 5.5Ω)		76437	17-1025			Includes 10 MMF capacitor
L38	2nd Sound IF	5Ω	3.1Ω	76438	17-1021	TV-108 ▲	1466 ▲	
L39	Ratio Det.	4Ω	.2ΩCT	76439	17-1033	TV-110	1468	Tertiary winding=.5Ω
L40	Horiz. Osc.	120Ω		76440	20-1402	TV-162	6183	Pri. tapped @ 85Ω; Horiz. waveform winding = 31Ω
L41	RF Choke	2.2Ω					4606	2.7 Microhenries; IRC Part # CLA
L42	RF Choke	2.2Ω					4606	2.7 Microhenries; IRC Part # CLA-Note 1
L43	RF Choke	.72Ω		76640			4604	1.5 Microhenries; IRC Part # CL-1
L44	RF Choke	.72Ω		76640			4604	1.5 Microhenries; IRC Part # CL-1

† Parallel with 3.3KΩ resistor.
* Drill mounting hole.
■ Parallel with 22KΩ resistor
▲ Drill new mounting holes.
Note 1. Some models use one 4.7 Microhenries RF Choke in place of L41 & L42, RCA Part # 76510.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: RCA Victor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L45	.310A	38Ω	1.3HY	77676	C2326 ①		TR-1733 ①	

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: RCA Victor PART No. FUSE	RCA Victor PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG P P/T	1/4A	73600		318.250 (3AG P/T-1/4A)		GJV 1/4	

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M2	Dial light	11765	# 51 bayonet
M3	Tuner	KRK29	KCS81F chassis VHF
M4	Tuner	KRK12B	KCS81J chassis VHF-UHF
M5	Crystal	77489	1N82 mixer used in KRK12B tuner
M6	Crystal	77675	1N64 video detector
M7	Switch	77656	TV-phono-tone
M8	Focus magnet	76168	Includes centering arm and focus adjustment screw
M9	Ion trap	76141	
A19	Trimmer cap	78397	Mica 80-150MMF KRK29 tuner 43.5MC trap
A22	Trimmer cap	77616	Mica 4-40 MMF KRK12B tuner 43.5MC trap
A15	Trimmer cap	71496	Mica 5-70MMF 41.25MC overcouple adjustment
B3, B6	Trimmer cap	75217	Dual mica 10-160MMF horiz. drive and horiz. locking
	Cabinet back	78354	Models 21D358, 21D358U
	Cabinet back	78355	Models 21D368, 21D368U
	Cabinet back	78356	All other models
	Disc	77756	Polystyrene indicator-maroon-KRK12B tuner
	Disc	77757	Polystyrene indicator-sand gray-KRK12B tuner
	Disc	77758	Polystyrene indicator-bronw-KRK12B tuner
	Escutcheon	78315	Channel marker KRK29 tuner
	Glass, safety	78314	
	Knob	77709	Brightness-brown for mahogany, walnut or red cherry cabinets
	Knob	77718	Brightness-beige for oak cabinets
	Knob	77734	Brightness-tan for maple or natural cherry cabinets
	Knob	77968	Chan. select brown for mahogany, walnut, or red cherry cab. KRK12B tuner
	Knob	77969	Chan. select. beige for oak cabinets KRK12B tuner
	Knob	77970	Chan. select. tan for maple or natural cherry cab. KRK12B tuner
	Knob	77708	Chan. select. KRK29 tuner
	Knob	77750	Fine tuning KRK12B tuner
	Knob	77707	Fine tuning brown-KRK29 tuner
	Knob	77717	Fine tuning beige-KRK29 tuner
	Knob	77733	Fine tuning tan KRK29 tuner
	Knob	77699	Contrast brown
	Knob	77719	Contrast beige
	Knob	77738	Contrast tan
	Knob	77735	Tone and phono brown
	Knob	77736	Tone and phono beige
	Knob	77737	Tone and phono tan
	Knob	77710	Off-on, volume

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L F BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control, and T1. If filaments light, substitute V22 and V23. Check B+ filter and decoupling components.

SMALL AND/OR DIM PIX

Substitute V22 and V23. Check B+ filter and decoupling components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M1. Check by substitution V21, V20, V19, V18 and V17. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check R132, C120, T3, T5A and other associated circuit components.	Check C109, C110, C111, C112, L40 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V17, V18, V19, V20, V21, V22 and V23. Proceed as outlined under "Loss of High Voltage". Check picture tube.

BLOOMING

Check by substitution V21, V20, V19, V18, V17, V22 and V23. Check R132, C120, T3, T5A, R129, R130, C113 and other associated circuit components.

GENERAL

RASTER SOUND NOPIX

See "Loss of Video".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5 and V6. Check video detector crystal and assembly. Check components associated with the video IF strip.

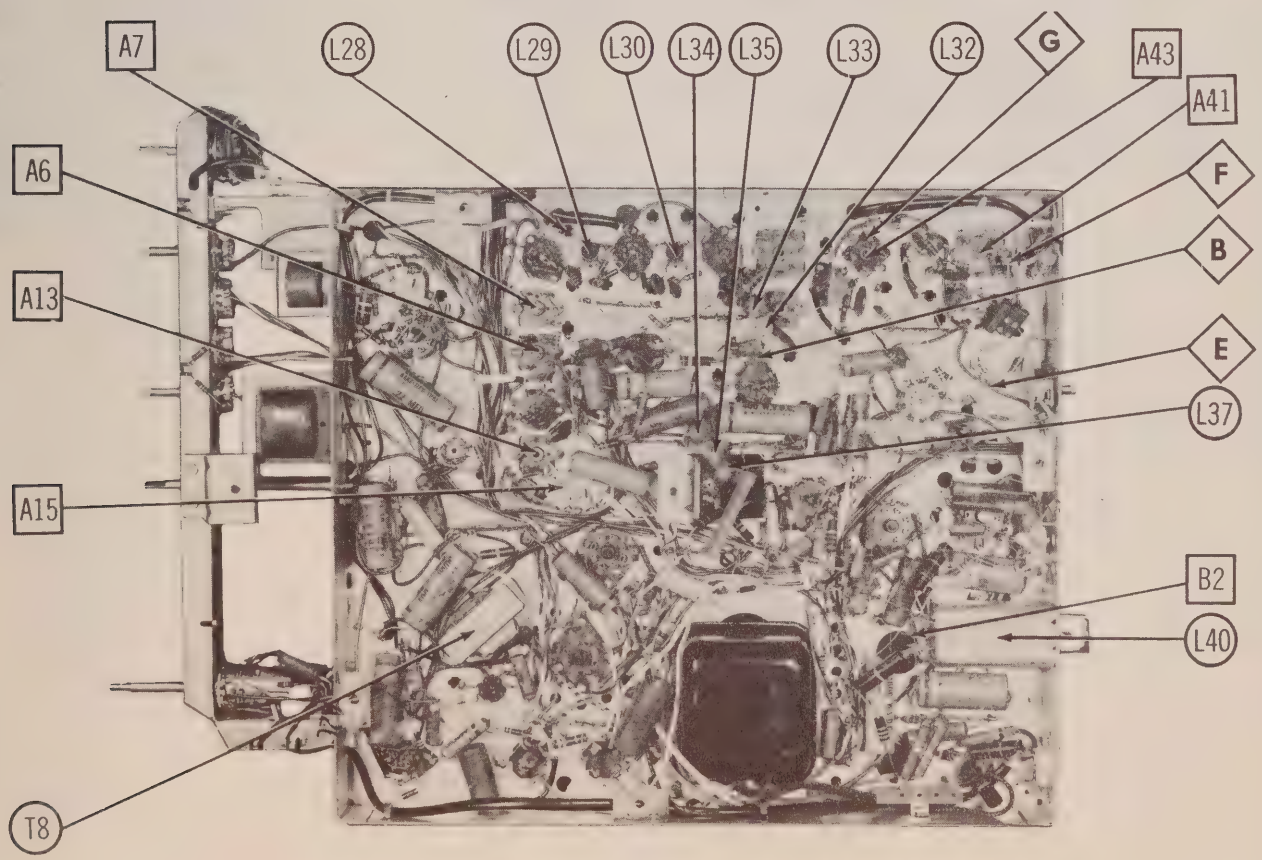
NO RASTER NO SOUND

See "Dead Set".

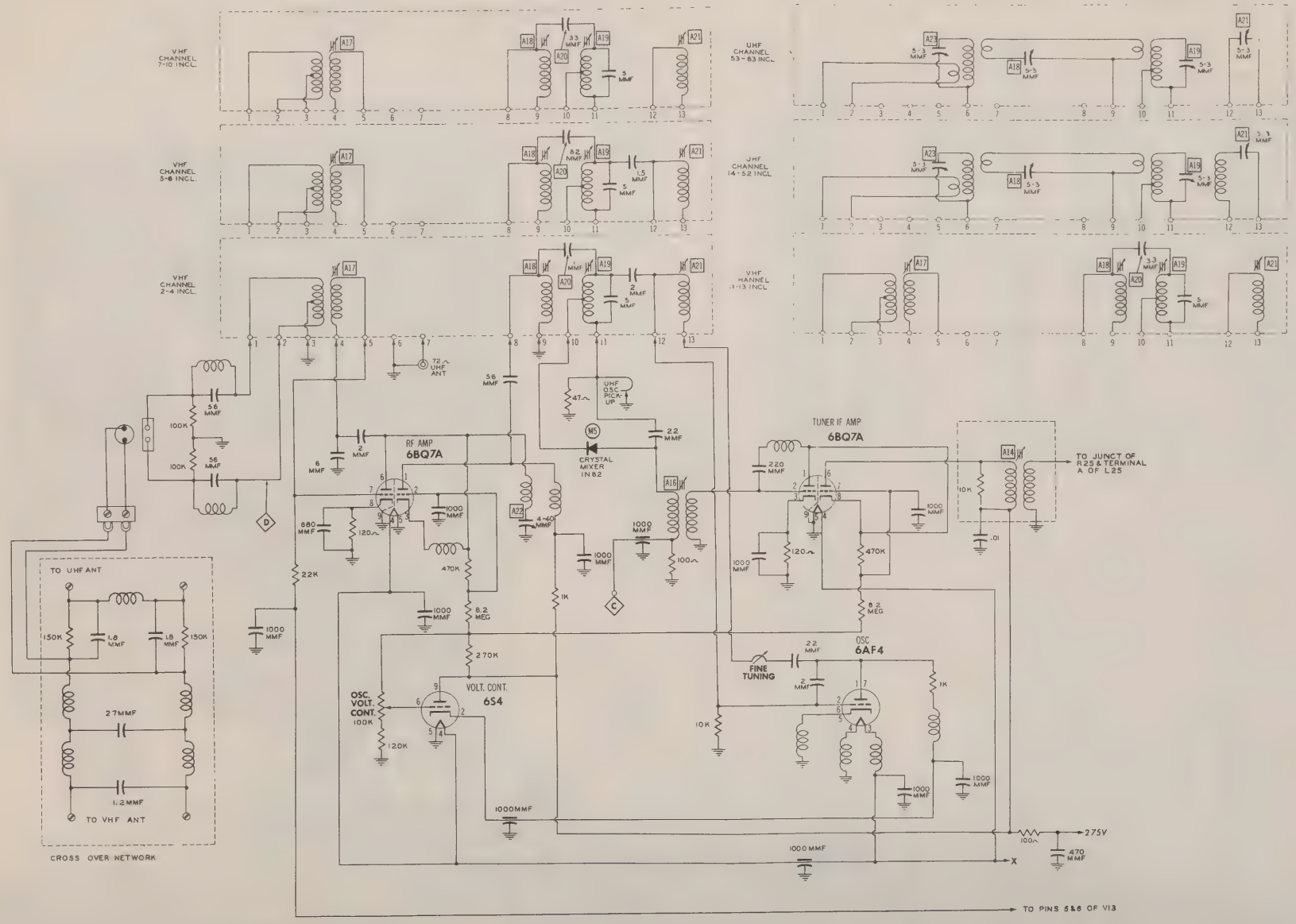
INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing. Check width coil for arcing by removing width jumper. If arcing ceases, replace width coil. The balance of the high voltage section may best be checked in a darkened room.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF-VHF TUNER KRK12B USED ON CHASSIS KCS81J

ALTERNATE TUNER SCHEMATIC

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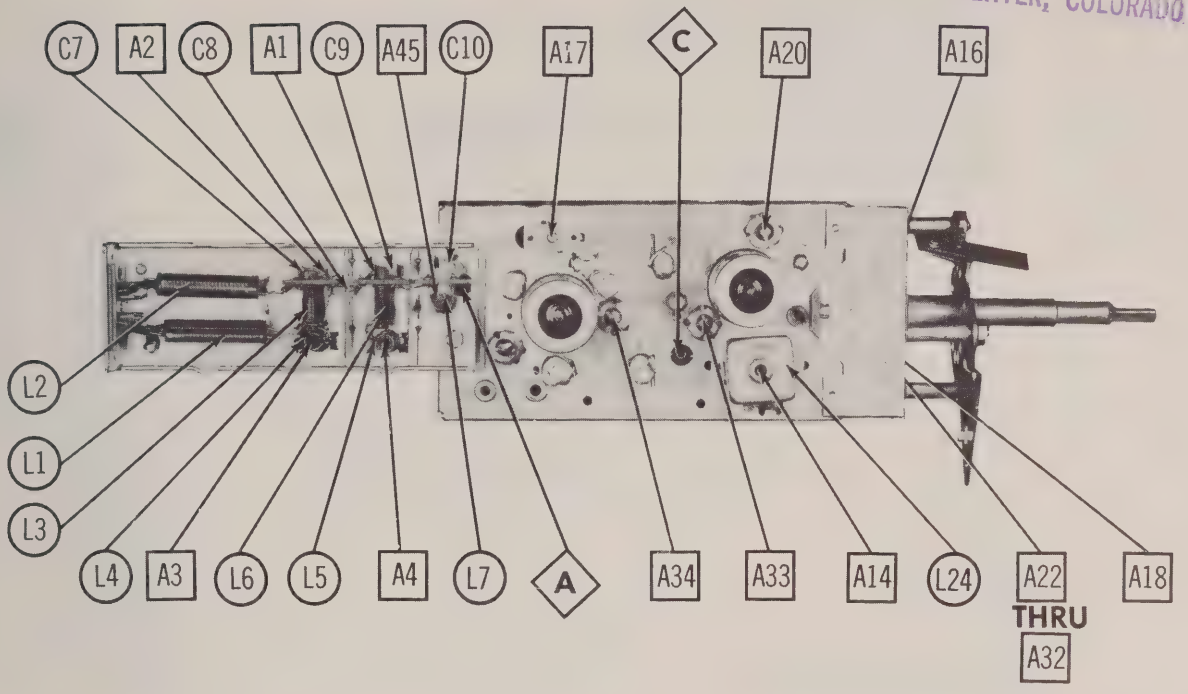
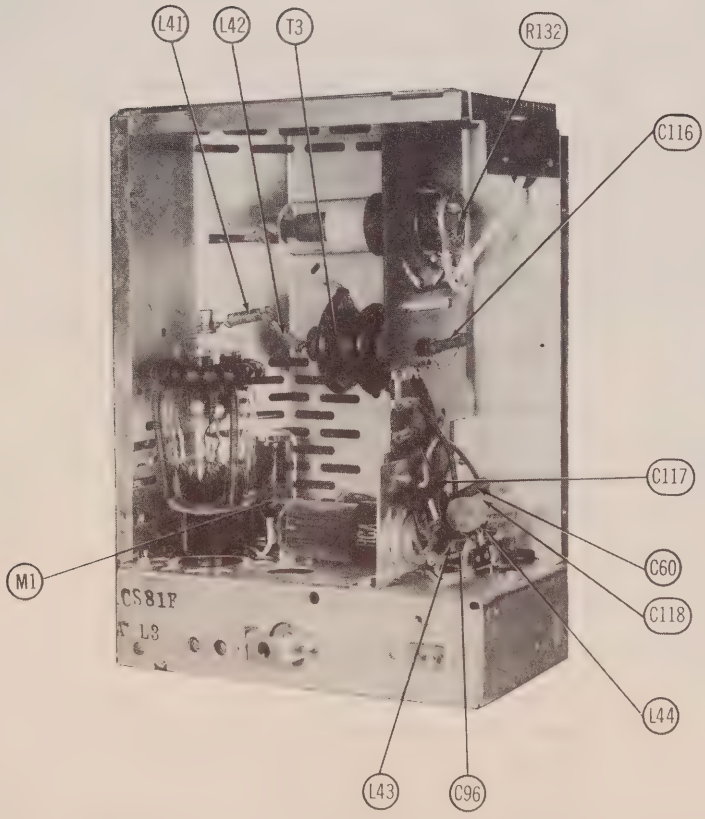


RF TUNER-TOP VIEW



HIGH VOLTAGE COMPARTMENT

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs.

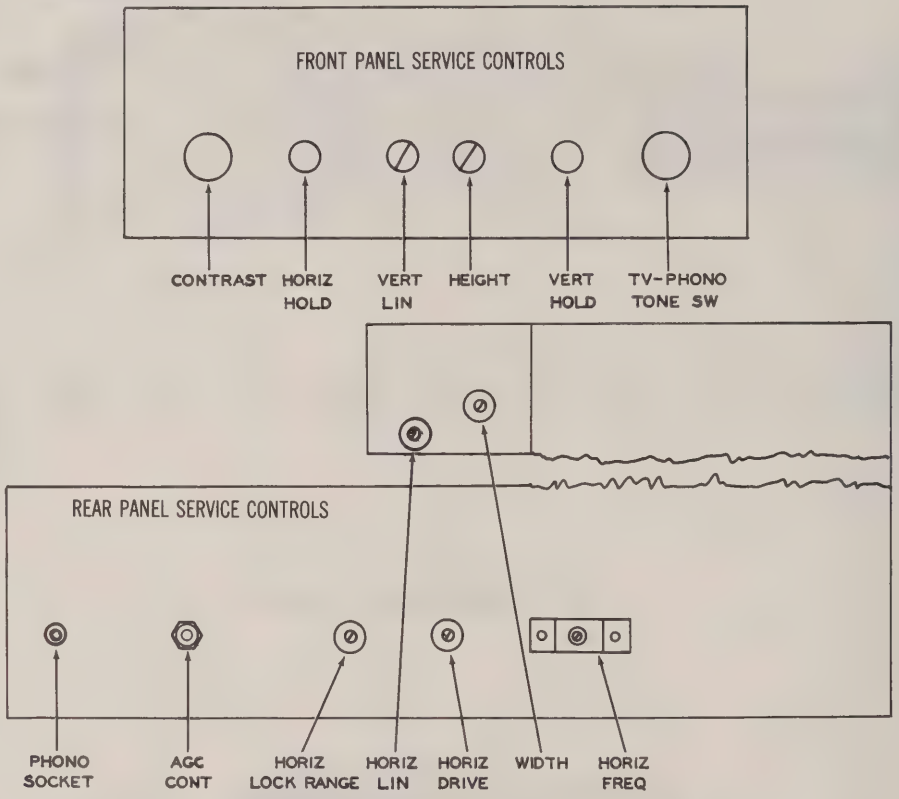
PICTURE TUBE SAFETY GLASS CLEANING

Remove 8 spring clips from inside front of cabinet. Remove metal strips surrounding safety glass. Remove safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal frequency slug (L40) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L39) located on bottom of chassis. (See tube placement chart). (Hole in bottom of cabinet to adjust).

FUSES

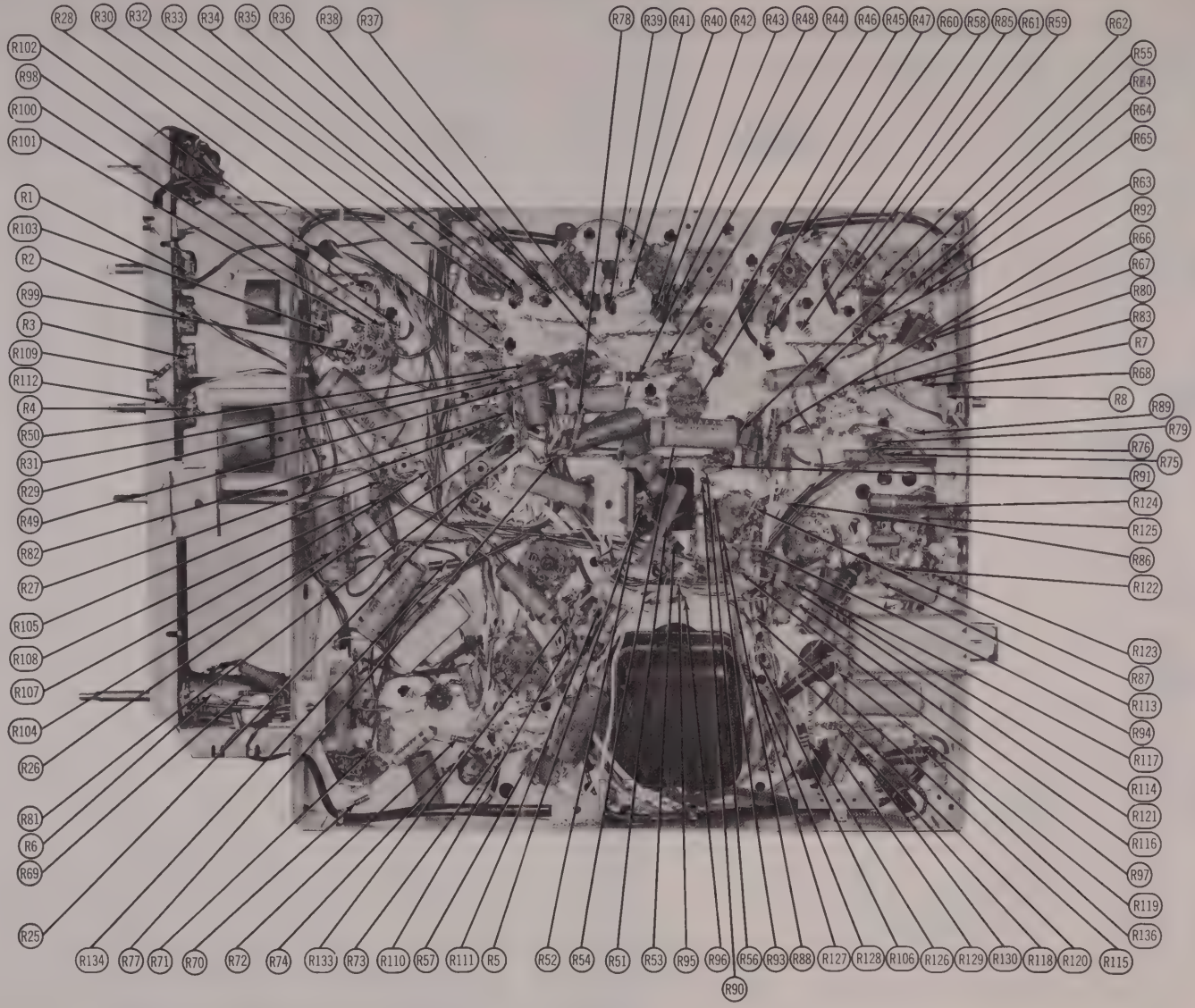
One fuse is used for horizontal sweep circuit protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflectinn yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 6 push on type control knobs from front panel.
2. Disconnect built-in antenna lead from rear cover.
3. Remove 2 wood and 2 metal screws. Remove rear cover.
4. Disconnect speaker, yoke plug, HV lead and CRT socket.
5. Remove 7 chassis bolts. Remove chassis.
6. Remove 4 speaker. Remove speaker.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

DENVER, COLORADO

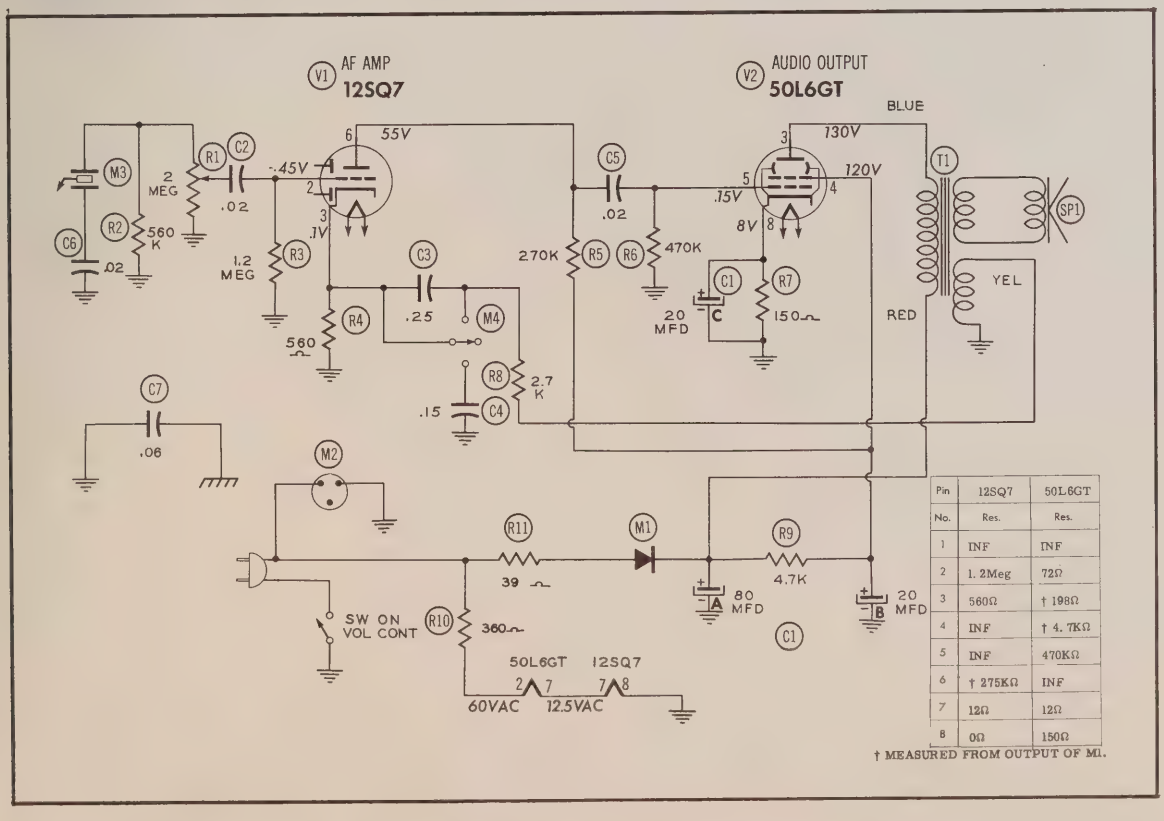
SILVERTONE MODELS
2243, 2246 (Ch. 137.914, -1, -2, -3)

PROPERTY OF
L. F.
3924 MONACO ST
DENVER, COLORADO

SILVERTONE MODELS
2243, 2246 (Ch. 137.914, -1, -2, -3)

SILVERTONE MODELS
2243, 2246 (Ch. 137.914, -1, -2, -3)

TRADE NAME	Silvertone Models 2243, 2246 (Ch. 137.914, -1, -2, -3)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual Record Player
TUBES (Two)	Types 12SQ7 (or) 12AT6 AF Amp., 50L6GT (or) 50C5 Audio Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .25 Amp. @ 117 Volts AC



Pin No.	12SQ7 Res.	50L6GT Res.
1	INF	INF
2	1.2Meg	72Ω
3	560Ω	† 198Ω
4	INF	† 4.7KΩ
5	INF	470KΩ
6	† 275KΩ	INF
7	12Ω	12Ω
8	0Ω	150Ω

† MEASURED FROM OUTPUT OF M1.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1A	AF Amplifier	C10570	12SQ7	8Q	Chassis 137. 914, -2
B	AF Amplifier	C10507	12AT6	7BT	Chassis 137. 914-1, -3
V2A	Audio Output	C10571	50L6GT	7S	Chassis 137. 914. -2
B	Audio Output	C10430	50C5	7CV	Chassis 137. 914-1, -3

CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	C10427	PRS150/80-40-20		EDL8415C		3N538	TVA-3455	Blue
B	20	150								Red
C	20	25								Yellow
C2	.02	200	C10497	P488-02	DF-203	PJ2S2		PT412	2TM-S2	
C3	.25	200	C10858	P488-25		PJ2P25		PT4025	2TM-P25	
C4	.15	200	C10857	P288-15		PTE4P15		TP417	2TM-P15	
C5	.02	200	C10497	P488-02	DF-203	PJ2S2		PT412	2TM-S2	
C6	.02	200	C10497	P488-02	DF-203	PJ2S2		PT412	2TM-S2	
C7	.06	200	C10502	P688-06		PTE6S6		PT616	6TM-S6	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	C10496	Q13-139	AG-66-Z	AB-76	U-55	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	KB-1	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	560KΩ	½	C8842	BTS-560K	
R3	1. 2Meg	½		BTS-1. 2Meg	Note 1
R4	560Ω	½	C10921	BTS-560	Note 2
R5	270KΩ	½	C10904	BTS-270K	
R6	470KΩ	½	C10305	BTS-470K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R7	150Ω	½	C9897	BTS-150	
R8	2700Ω	½	C10899	BTS-2700	Note 3
R9	4700Ω	½	C10429	BTS-4700	
R10	360Ω	1Ω	C10584	1 3/4A-350	
R11	39Ω	½	C10428		

Note 1. Some models may use 5. 6Meg resistor in this application.
Note 2. Some models may use a 680Ω resistor in this application.
Note 3. Some models may use a 2200Ω resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.#1	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	2KΩ	3Ω	198Ω	1. 1Ω Sec.#2 1Ω	C10859					

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5 1/4"	PM	3Ω	C10901	ST-803 Mod P525	52A1	

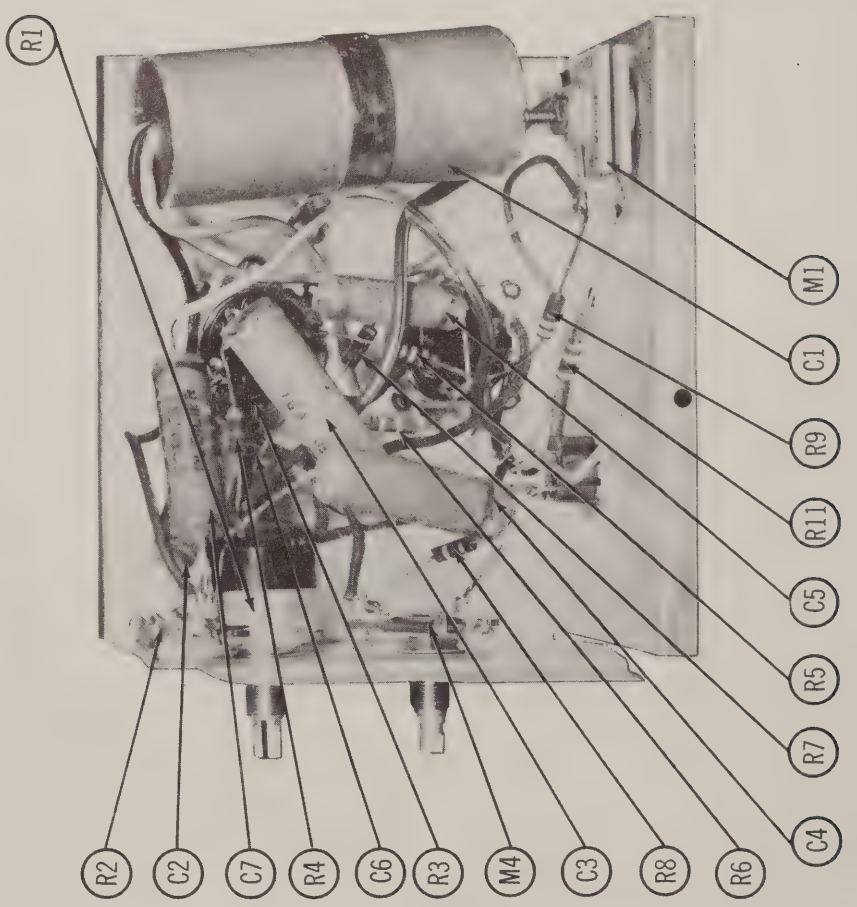
SELENIUM RECTIFIER

ITEM No.	RATING: CURRENT	REPLACEMENT DATA: SILVERTONE PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	NOTES
M1	.053	C10432	8J1	1002A	6S65	65	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M2	C10976					43	O-2	

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	WALCO PART No.	JENSEN PART No.	REMARKS
M3	C10637	W-3AGA or W-3AGS	S-642 or S-652	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	Switch	C10879	Tone Selector
	Case	C2246	
	Handle	C10506	
	Knob	C10903	Off-on -volume, Tone (2 used)

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The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

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DENVER, COLORADO

SILVERTONE MODELS 2276, 2277, 3276, 3277 (Ch. 456.150-14, -18, -61)

MODEL 3276

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PHOTOFACT* Folder
*TRADE MARK

SILVERTONE MODELS 2276, 2277, 3276, 3277 (Ch. 456.150-14, -18, -61)

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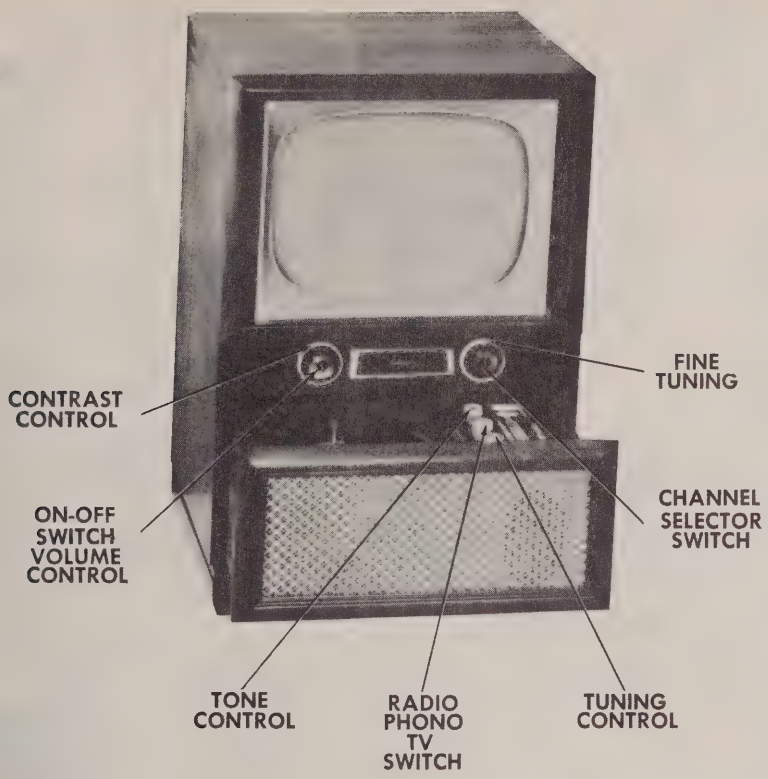

SILVERTONE MODEL 3276

TRADE NAME	Silvertone Models 2276, 2277 (Ch. 456.150-14, -18), 3276,3277 (Ch. 456.150-61)
MANUFACTURER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Ill.
TYPE SET	TV-Radio-Phono Combination Receiver
TUBES	Twenty-three
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.83 Amp. @ 117 Volts
TUNING RANGE—	Channels 2 thru 13, Video IF 26.1MC , Sound IF 21.5MC (Intercarrier) AM Radio 540-1850KC, AM IF 455KC

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FOR SERVICE INFORMATION ON RECORD CHANGER, SEE V-M MODEL 950, PHOTOFACT SET 107, FOLDER 13, ALSO, SUPPLEMENT SET 131 FOLDER 17, OR RECORD CHANGER MANUAL CM-3.

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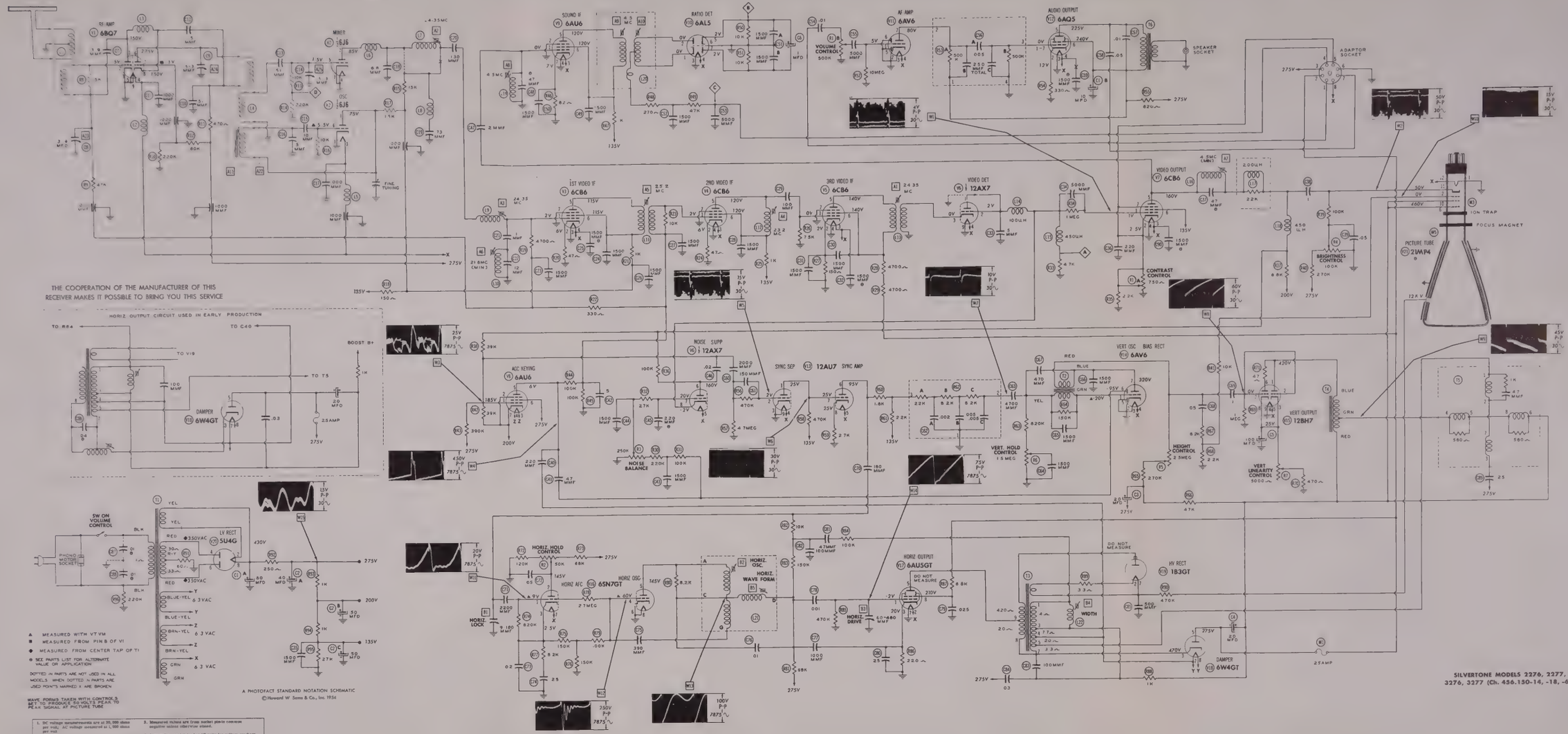
SILVERTONE MODELS 2276, 2277, 3276, 3277 (Ch. 456.150-14, -18, -61)


RF AMP V1 6BQ7
MIXER V2 6J6
OSC V3 6J6
FINE TUNING
SOUND IF V5 6AU6
RATIO DET V10 6AL5
AF AMP V11 6AV6
VOLUME CONTROL 500K
AUDIO OUTPUT V17 6AQ5
SPEAKER SOCKET
ADAPTOR SOCKET
1ST VIDEO IF V2 6CB6
2ND VIDEO IF V4 6CB6
3RD VIDEO IF V5 6CB6
VIDEO DET V6 12AX7
VIDEO OUTPUT V7 6CB6
ION TRAP
FOCUS MAGNET
PICTURE TUBE V21 21MP4
CONTRAST CONTROL
BRIGHTNESS CONTROL
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
HORIZ OUTPUT CIRCUIT USED IN EARLY PRODUCTION
DAMPER V18 6W4GT
NOISE SUPP V6 12AX7
ACC KEYING V9 6AU6
SYNC SEP V13 12AU7 SYNC AMP
NOISE BALANCE
VERT OSC BIAS RECT V14 6AV6
VERT. HOLD CONTROL 1.5 MEG
HEIGHT CONTROL 2.5MEG
VERT LINEARITY CONTROL 5000
VERT OUTPUT V15 12BH7
SW ON VOLUME CONTROL
PHONO MOTOR SOCKET
LV RECT V20 5U4G
HORIZ HOLD CONTROL
HORIZ AFC V16 6SN7GT
HORIZ OSC
HORIZ. OSC.
HORIZ. WAVE FORM
HORIZ LOCK
HORIZ DRIVE
HORIZ OUTPUT V17 6AU5GT
DO NOT MEASURE
HV RECT V19 1B3GT
WIDTH
DAMPER V18 6W4GT
▲ MEASURED WITH VTVM
■ MEASURED FROM PIN 8 OF V1
◆ MEASURED FROM CENTER TAP OF T1
⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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1. DC voltage measurements are at 20,000 ohms per volt; AC voltage measured at 1,000 ohms per volt.
2. Measured values are from socket pin-to common negative unless otherwise noted.
3. Pin numbers are counted in a clockwise direction on bottom of socket.
4. Low voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.

SILVERTONE MODELS 2276, 2277, 3276, 3277 (Ch. 456.150-14, -18, -61)

SILVERTONE MODELS 2276, 2277, 3276, 3277 (Ch. 456.150-14, -18, -61)

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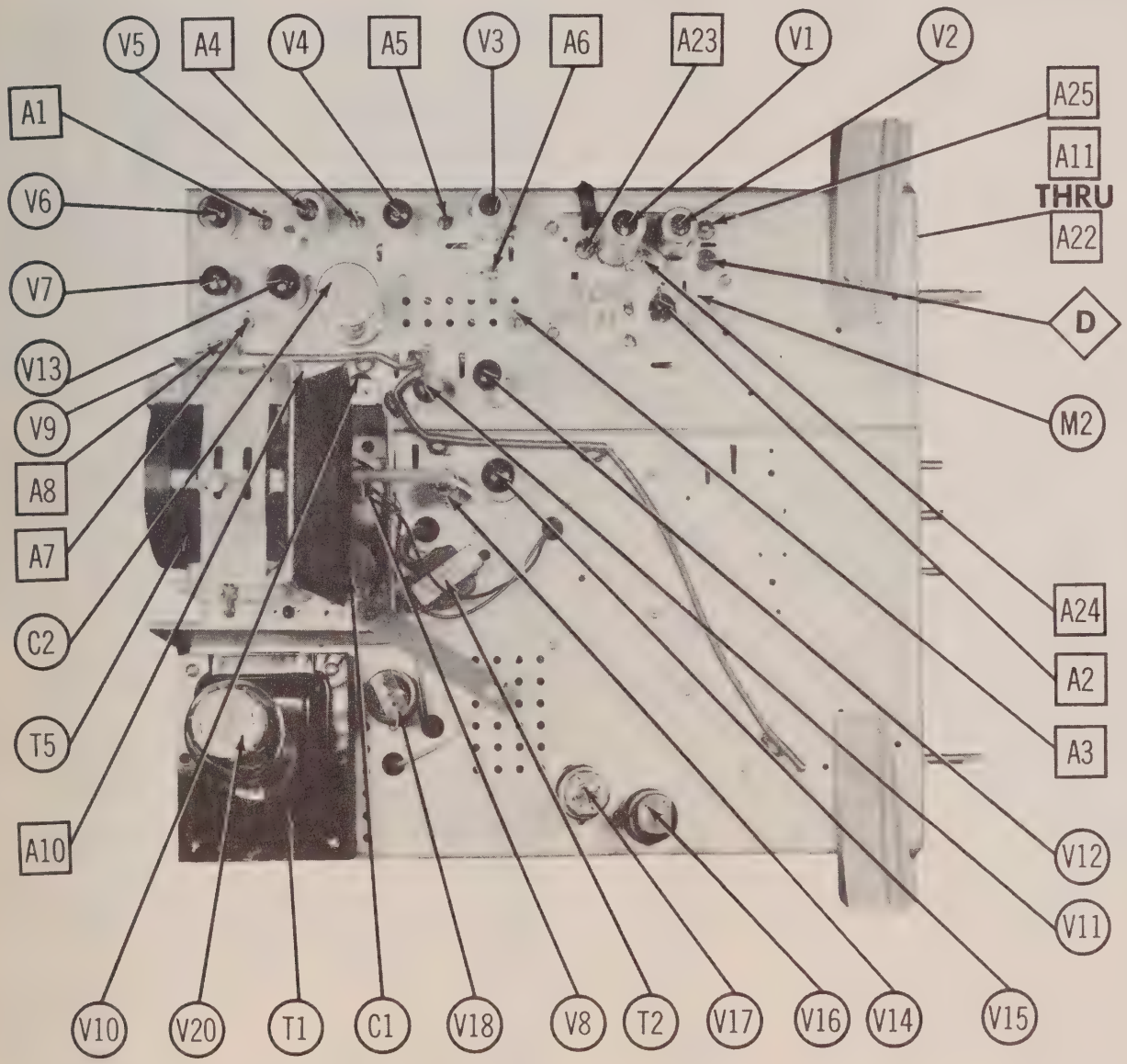

CHASSIS TOP VIEW

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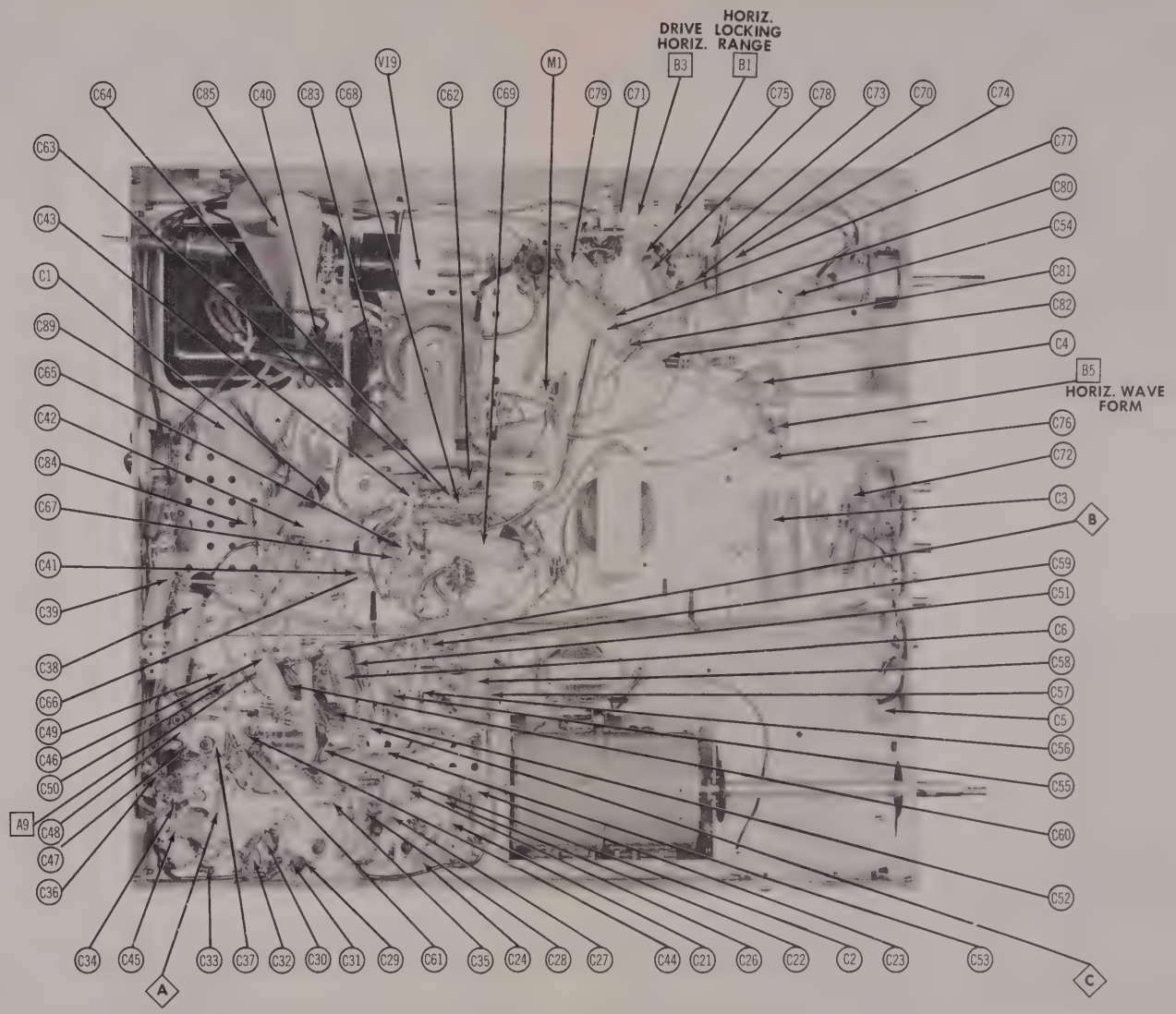
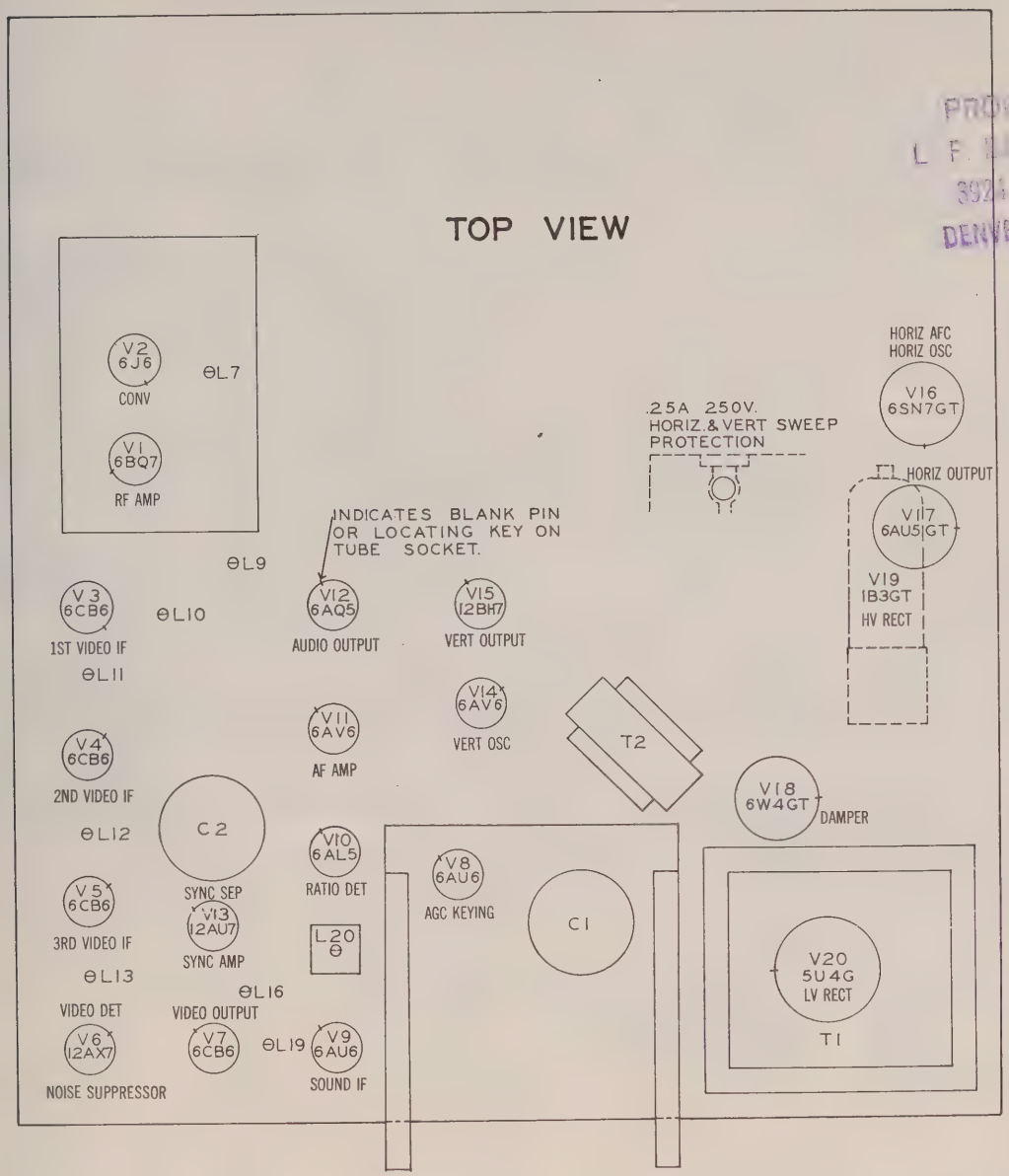


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V20

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V8, V21
Has pic, no sound - V9, V10, V11, V12
Overloaded picture - V8

SYNC FAILURE
No vert. sync - V13, V14
No horiz. sync - V13, V16
No vert. or horiz. sync - V6, V13

SWEEP FAILURE
No raster, has sound - V16, V17, V18, V19, V21, Fuse (M1)
No vert. deflection - V14, V15
Poor vert. linearity or foldover - V13, V14, V15
Poor horiz. linearity or foldover - V16, V17, V18
Narrow picture - V16, V17, V18, V19, V20
Vert. off freq. - V13, V14
Horiz. off freq. - V13, V16

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal oscillator tube (V16) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C42. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24.35MC (Unmod)	Any	DC probe to point (A) Common to chassis.	A1	Adjust for maximum deflection. Attenuate generator output to maintain 1 to 1.5 Volt reading on VTVM.
2.	"	"	"	"	"	A2	Connect a 1KΩ resistor across the grid resistor R19, of V3, Adjust A2 for maximum deflection . Remove the 1K resistor.
3.	"	"	"	"	"	A3	Adjust for maximum deflection.
4.	"	"	23.2MC	"	"	A4	"
5.	"	"	25.2MC	"	"	A5	"
6.	"	"	21.6MC	"	"	A6	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the syncrhonized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.6MC 26.1MC	Any	Vert. Amp. to point (A) . Low side to chassis.		Check for response similar to Fig. 1 with 21.6MC in trap notch and 26.1MC at 50% response. If necessary readjust A1 thru A5 for desired response.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru detector (Fig. 2) to pin 11 of picture tube. Common to chassis.	A7	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B) Common to chassis.	A8, A9	Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point (C) Common to chassis.	A10	Adjust for a zero reading. A positive and negative reading will be obtained on either side to the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to point (A) Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B) . Low side to chassis.	A8, A9	Disconnect stabilizer capacitor C6. Adjust for maximum amplitude and symmetry as in Fig. 3.
10.	"	"	"	"	"	Vert. Amp. to point (C) . Low side to chassis.	A10	Reconnect capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

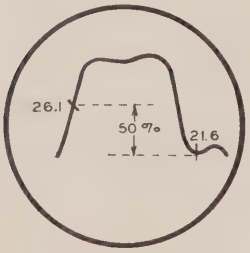

FIG.1

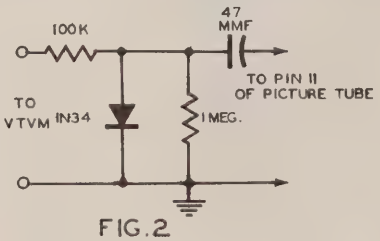

FIG.2

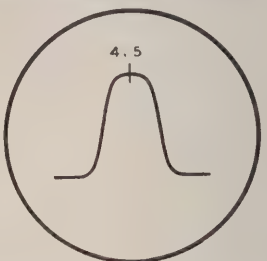

FIG. 3

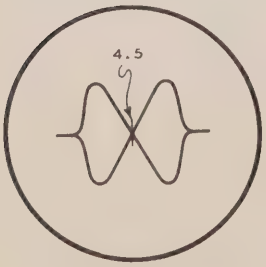

FIG. 4

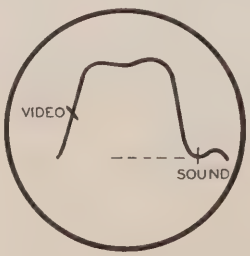

FIG.5

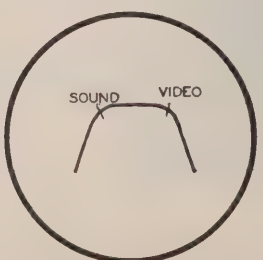

FIG.6

TV ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

PENTODE TUNER

Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A26. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A26 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency.

THE FOLLOWING APPLIES TO BOTH PENTODE AND CASCODE TUNERS

The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is tuned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal imput of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the time tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 2 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	All	Adjust to place sound marker in trap notch as shown in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A12	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A13	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A14	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A15	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A16	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A17	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A18	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A19	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A20	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A21	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A22	

RF AND MIXER ALIGNMENT

Reduce the battery bias to 1.5 volts.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (D) Low side to chassis.	A23, A24, A25	Adjust for curve of maximum amplitude with band width as shown in Fig. 6.
13.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 6. If markers fall below 70% on any channel make slight compromise adjustments of A23, A24 and A25 with channel selector set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

RADIO ALIGNMENT INSTRUCTIONS

RADIO ALIGNMENT

Turn Radio-Phono-TV switch to "Radio".
Set tone control fully clockwise.
Turn tuning gang fully closed and set pointer 7/8 inch from left edge of dial back plate.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
14.	.1MFD	High side to pin 7 (grid) of 6BE6 (V22). Low side to chassis.	455KC	Radio	Tuning gang fully open	Across voice coil	A27, A28 A29, A30	Adjust for maximum output.
15.		Loop	1400KC	"	1400KC	"	A31	Tune pointer to 1½" from right hand edge of dial back plate for 1400KC dial setting. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
16.		"	600KC	"	Tune to 600KC signal	"	A32	Adjust for maximum output while rocking gang.
17.		"	1400KC	"	1400KC	"	A31, A33	Adjust in order given for maximum output.

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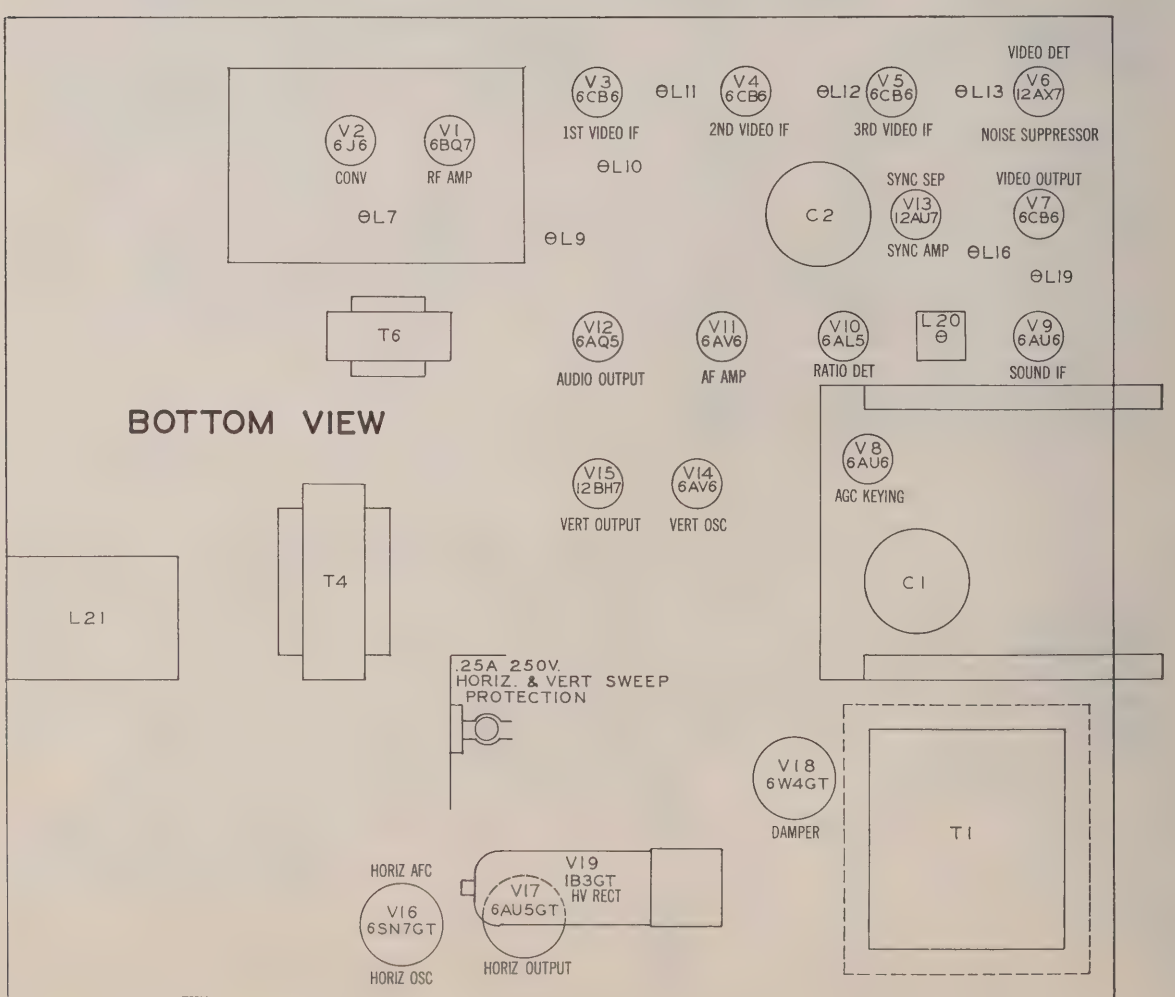
DENVER, COLORADO

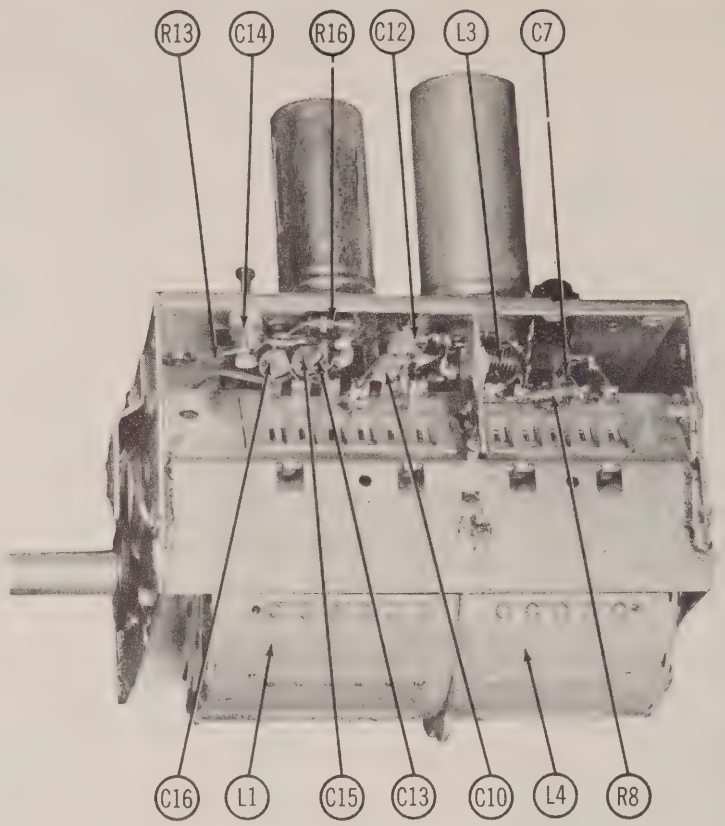
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	INF	150KΩ	0Ω	.1Ω	0Ω	†720Ω	†100KΩ	INF	0Ω
V 2	6J 6	†17KΩ	†17KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	100KΩ	47Ω	0Ω	.1Ω	†3.4KΩ	†3.4KΩ	0Ω		
V 4	6CB6	100KΩ	47Ω	.1Ω	0Ω	†3.2KΩ	†3.2KΩ	0Ω		
V 5	6CB6	7.5KΩ	150Ω	.1Ω	0Ω	†9.6KΩ	†9.6KΩ	0Ω		
V 6	12AX7	4.7KΩ	4.7KΩ	.4Ω	.1Ω	.1Ω	†110KΩ	150KΩ	4.7KΩ	0Ω
V 7	6CB6	1 Meg	300Ω	.1Ω	0Ω	†8KΩ	†2.2KΩ	300Ω		
V 8	6AU6	†24KΩ	†1.2KΩ	¶0Ω	¶.1Ω	200KΩ	†250Ω	†1.2KΩ		
V 9	6AU6	1.9Ω	0Ω	.1Ω	0Ω	†3.2KΩ	†3.2KΩ	82Ω		
V 10	6AL5	INF	INF	0Ω	.1Ω	10KΩ	0Ω	10KΩ		
V 11	6AV6	10 Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	†500KΩ		
V 12	6AQ5	500KΩ	330Ω	0Ω	.1Ω	†1.5KΩ	†1.1KΩ	500KΩ		
V 13	12AU7	†470KΩ	5.1Meg	0Ω	.1Ω	.1Ω	†6.2KΩ	†470KΩ	2.7KΩ	0Ω
V 14	6AV6	1.5Meg	0Ω	0Ω	.1Ω	0Ω	470KΩ	#800KΩ		
V 15	12BH7	#2.5KΩ	1 Meg	1.8KΩ	.1Ω	.1Ω	#2.5KΩ	1 Meg	1.8KΩ	0Ω
V 16	6SN7GT	850KΩ	†60KΩ	300KΩ	250KΩ	†68KΩ	0Ω	.1Ω	0Ω	
V 17	6AU5GT	470KΩ	.1Ω	220Ω	INF	#20Ω	INF	0Ω	†7KΩ	
V 18	6W4GT	#33Ω	INF	100KΩ	INF	†250Ω	200KΩ	#23Ω	#23Ω	
V 19	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap #450Ω
V 20	5U4G	INF	25KΩ	INF	■30Ω	INF	■33Ω	INF	25KΩ	
V 21	21MP4	0Ω	12KΩ	Pin 6 #1KΩ	Pin 10 #1KΩ	Pin 11 150KΩ	Pin 12 .1Ω			

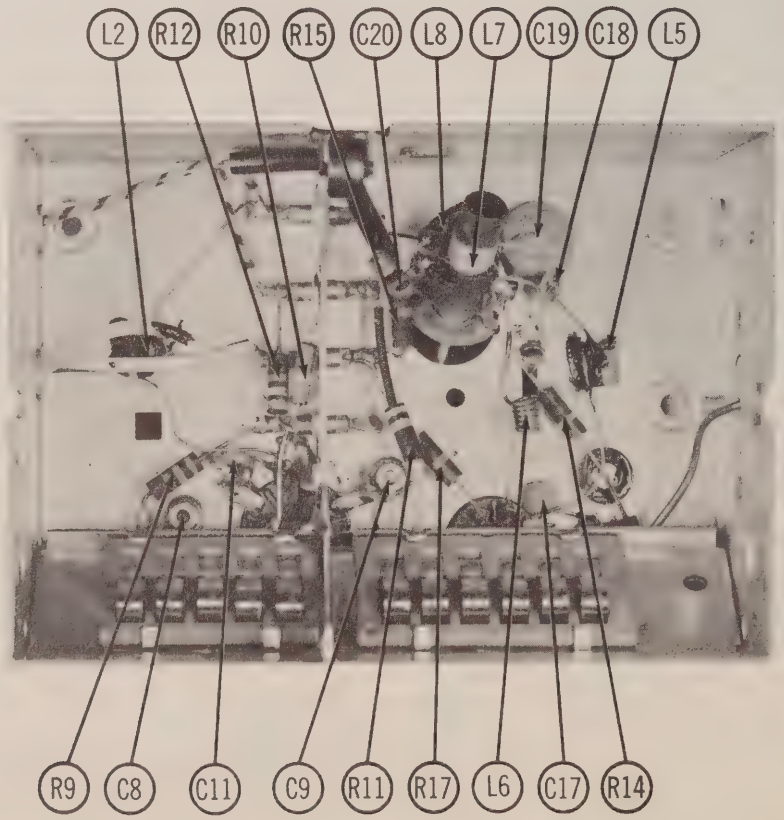
ALL MEASUREMENTS TAKEN IN TV POSITION ONLY
† MEASURED FROM PIN 8 OF V20
# MEASURED FROM PIN 3 OF V18
¶ MEASURED FROM PIN 3 OF V8
■ MEASURED FROM CENTERTAP OF T1



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3014 MEADE ST.
DENVER, COLORADO

CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal lock control fully counter clockwise, and the horizontal lock trimmer (B1) fully clockwise.

Turn the horizontal oscillator slug (B2) counter clockwise until the picture loses sync, then clockwise until the picture falls into synchronization.

Turn the horizontal lock control to the middle of its range and adjust the horizontal drive trimmer (B3) counter clockwise as far as possible without crowding of the picture. Adjustment of B3 may make it necessary to readjust B2, as before, to maintain sync.

With the horizontal lock at maximum clockwise position, momentarily interrupt the signal by switching to another channel and back again.

Turn the horizontal lock control slowly counter clockwise and note the least number of diagonal bars present just before the picture falls into sync. If this number is not between 2 and 4 adjust B1 for that condition.

Adjust the width slug (B4) for a picture slightly wider than necessary to fill the picture mask.

HORIZONTAL WAVEFORM ADJUSTMENT

Connect the vertical amplifier of an oscilloscope to terminal C of L21. If necessary adjust the horizontal waveform slug (B5) for a waveform on the scope as in Fig. 7 with broad and narrow peaks of equal height.

NOISE BALANCE CONTROL ADJUSTMENT

Tune set to strongest available TV signal.

Turn noise balance control fully clockwise, then slowly counter clockwise until picture begins to distort. Turn the control clockwise just enough to eliminate the distortion.

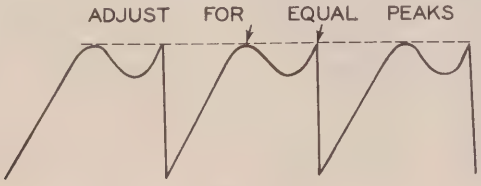
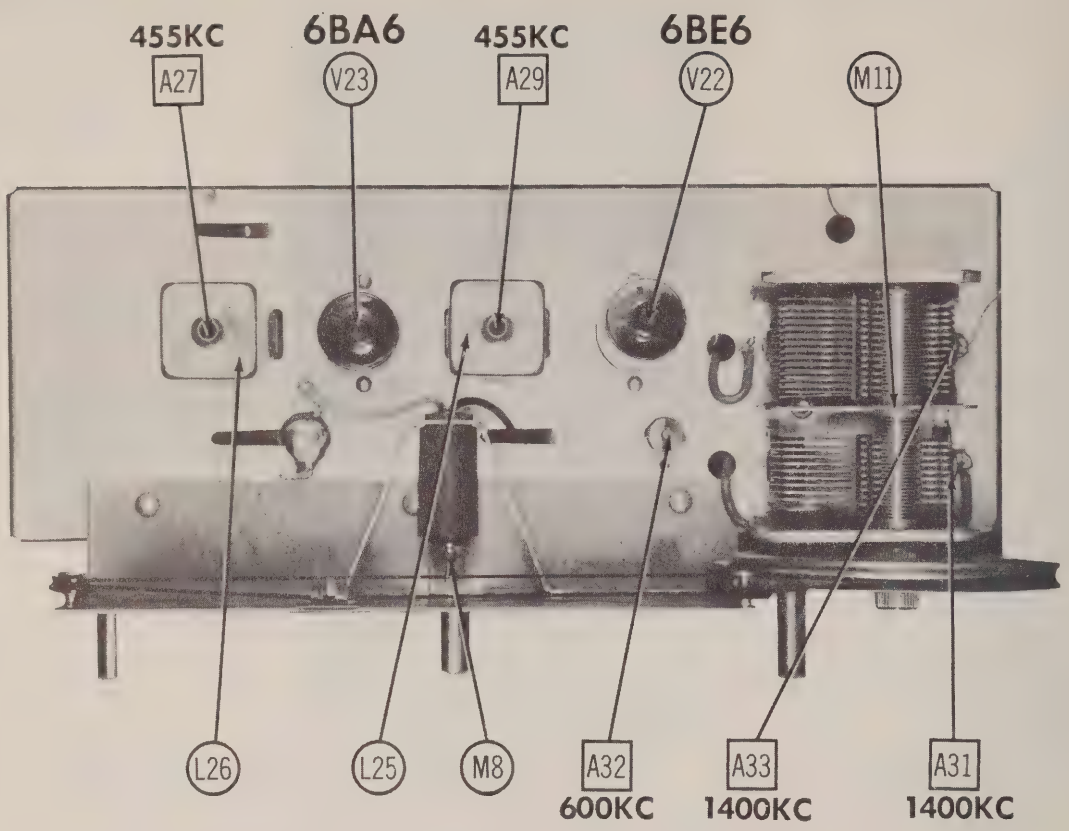


FIG. 7

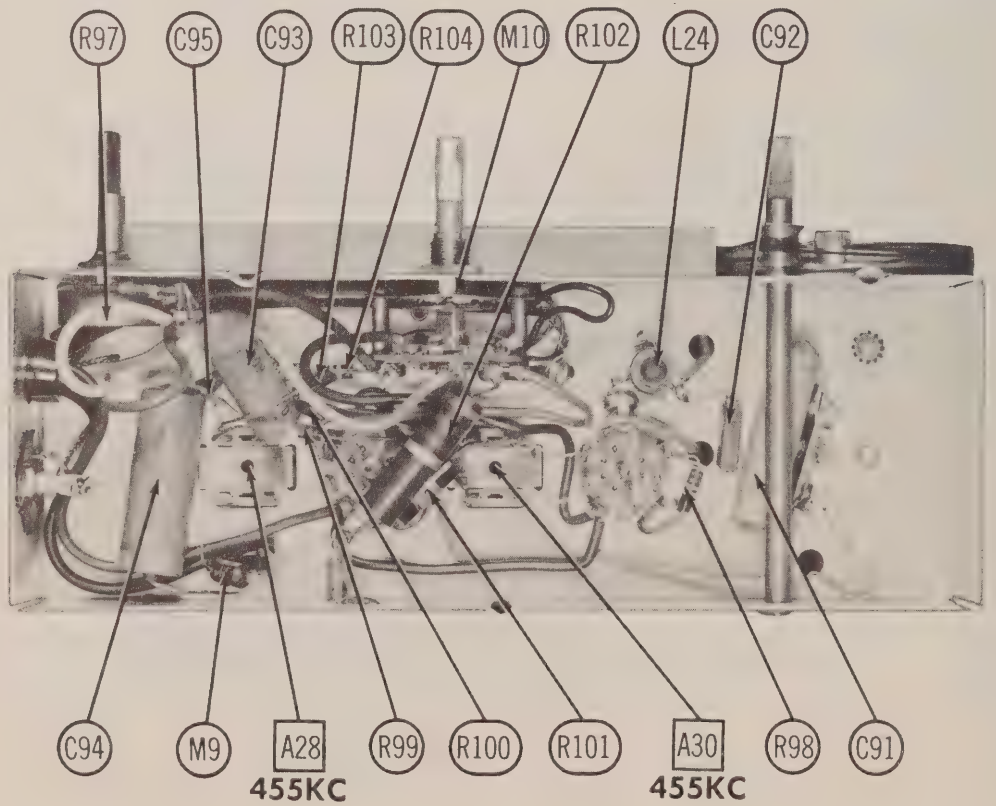
DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 10 wood screws. Remove rear cover.
3. Disconnect built-in antenna. Remove 2 wood screws. Remove antenna bracket.
4. Disconnect AC plug (phono motor), radio power plug, phono audio cable plug.
5. Remove 4 chassis bolts. Remove chassis.

1. Remove 3 push on type control knobs from front panel.
2. Remove 8 chassis mounting board screws. Remove mounting board.
3. Remove 3 metal screws. Remove radio from mounting board.



RADIO CHASSIS-TOP VIEW



RADIO CHASSIS-BOTTOM VIEW

PROPERTY OF
L F [illegible]SHIP
3924 MEADE ST
DENVER, COLORADO

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
V1A	RF Amplifier	6BQ7 (or)	6BQ7	9AJ	Cascode Tuner
		6BK7	6BK7	9AJ	
B	RF Amplifier	6CB6	6CB6	7CM	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Detector-Noise Suppressor	12AX7	12AX7	9A	
V7	Video Output	6CB6	6CB6	7CM	
V8	AGC Keying	6AU6	6AU6	7BK	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier	6AV6	6AV6	7BT	
V12	Audio Output	6AQ5	6AQ5	7BZ	
V13	Sync Separator-Sync Amplifier	12AU7	12AU7	9A	
V14	Vert. Oscillator - Bias Rectifier	6AV6	6AV6	7BT	
V15	Vert. Output	12BH7	12BH7	9A	
V16	Horiz. AFC-Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V17	Horiz. Output	6AU5GT	6AU5GT	6CK	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rectifier	1B3GT	1B3GT	3C	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA				RETMA BASE TYPE	NOTES
	Silvertone PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.		
V21A	21MP4	21MP4	21MP4	21MP4	12C	
B	20HP4	20HP4	20HP4		12M	
C	20HP4A	20HP4A	20HP4A		12L	
		20LP4	20LP4		12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▪80	450	PMA-42000	AFH2-62		BO47		FP245	TVL-2776	
B	▲10	400								
C2A	▪40	450	PMA-42001	AFH3-44		CO35		FP240		
B	■50	350						TC78		
C	▲50	300								
C3	20	300	PMA-42006	PRS450/20		BR2045A		TC65	TVA-1608	
C4	20	300	PMA-42006	PRS450/20		BR2045A		TC65	TVA-1608	
C5	100	50	PMA-42005	PRS50/100		BRH501		TC3501	TVA-1310	
C6	1	50	PMA-42002	PRS150/4		BBR1-50T		TC31	TVA-1300	
C7	3.9									
C8	3-9				829-10					
C9	.5-3				829-3			CT565A		
C10	51									
C11	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C12	1.5				TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C13	51									
C14	.5-3				829-3			CT565A		
C15	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C16	5			SI5N750	TCN-5		N750K-050	NT-551	5TCUB-V5	
C17	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C18	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C19	73									
C20	130			SI130	D6-131		GP2K-131	UC-5313	5GA-T13	
C21	1		PMA-40519-1		TCZ-1		NP0K-010		5TCCB-V1	
C22	12			SI12	D6-120		GP1K-120	UC-5412	5GA-Q12	
C23	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C24	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C25	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	Note 1
C26	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C27	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C28	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C29	100		PMB-40518-14	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C30	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C31	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C32	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	Note 1
C33	5		PMB-40518-1	SI5	TCZ-4.7	5W5V5	GP1K-050	UC-555	5GA-V5	
C34	5000		PMA-40517-3	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C35	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C36	220		PMB-40518-19	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C37	47			SI47NP0	TCZ-47		NP0K-470	ZT-5447	5TCC-Q47	Note 2
C38	.1	600	PMB-41006-51	P688-1	DF-104	PTE6P 1		PT601	6TM-P1	
C39	.05	400	PMB-41006-30	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C40	220	150	PMA-40005-1							
C41	47	500	PMB-40003-15	1468-00005	D6-470	5W5Q5	GP1K-470	MC225	1FM-45	
C42	.5	100	PMA-41008	P288-5		PJ2P5		PT405	2TM-P5	
C43	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C44	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C45	220		PMB-40518-19	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	Note 3
C46	.02	400	PMB-41006-28	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C47	2		PMB-40519-3		TCZ-2.2		NP0K-2R2		5TCCB-V22	
C48	47			SI47NP0	TCZ-47		NP0K-470	ZT-5447	5TCC-Q47	Note 2
C49	1500		PMB-40518-24	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C50	1500		PMA-40517-2	SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C51A	1500		PMA-40517-4	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C52	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C53	5000		PMB-40518-32	SI5000	D6-502	TM5D5	GP2-333-502	UC-525	5HK-D5	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C54	.01	400	PMB-41006-7	P488-01	D6-103	PTE4S1	GP2-333-103	PT41I	4TM-S1	
C55	5000		PMA-40517-3	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C56A	.005									
B	250		†PMA-95001		†PC-70		†1406-01		†104C4	
C										
C57	.01	600	PMB-41006-45	P688-01	D6-103	PTE6S1	GP2-333-103	PT61I	6TM-S1	
C58	.05	600	PMA-41006-49	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C59	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	Note 1
C60	2000		PMB-40518-27	SI2000	D6-202	TM5D2	GP2-333-202	UC-522	5HK-D2	
C61	150		PMB-40518-17	SI150	D6-151	TM5E15	GP2K-151	UC-5315	5GA-T15	
C62A	.002			P688-002		PTE5D2		PT622		
B	.005		+ PMA-95000	P688-005	*PC-100	PTE5D5	*1405-01	PT625	*101C1	
C	.005			P688-005		PTE5D5		PT625		
C63	4700	500	PMB-40003-63	1464-005		1DR5D5		MCB465	MS-25	
C64	1500		PMB-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C65	1500		PMB-40518-24	SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C66	1500		PMA-40517-2	SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C67	470		PMA-40518-23	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C68	.05	600	PMB-41006-49	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C69	.1	600	PMB-41006-51	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C70	180	500	PMB-40003-29							
C71	2200	500	PMB-40003-55							
C72	.05	400	PMB-41006-30	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C73	.02	400	PMB-41006-28	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C74	.25	200	PMA-41006-15	P488-25		PTE4P25		PT4025	2TM-P25	
C75	390	500	PMB-40003-37	1469-0004		5R5T4		MCB243	MS-34	
C76	.01	200	PMA-41009	489-01				PX106		
C77	1000	500	PMB-40003-47	1464-001		1R5D1		MCB255	MS-21	
C78	.001	600	PMB-41006-39	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C79	.025	600	PMB-41006-47	P688-025				PT651		
C80	.25	200	PMA-41006-15	P488-25		PTE4P25		PT4025	2TM-P25	
C81	47	500	PMB-40003-15	1469-00005		5R5Q5		MCB225	MS-45	
C82	100		PMB-40518-14	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C83	390	1500	PMA-40005-2							
C84	.03	400	PMB-41006-75	P488-03		PTE4S3		PT413	4TM-S3	
C85	500	20000	PMB-40003-37	HV30C	TV3-502	MM-C30T5	413-501	HV30035	30DK-T5	
C86	.04	600	PMB-41006-78	P688-04		PTE6S4		PT614	6TM-S4	Note 1
C87	.01	600	PMA-41007-45	6892GXY-01		PJ6S1		PT61I	6TM-S1	Note 1
C88	.01	600	PMA-41007-45	6892GXY-01		PJ6S1		PT61I	6TM-S1	Note 1
C89	.25	600	PMB-41006-53	684-25		PTE6P25		PT6025	6TM-P25	
C90	1500		PMA-40517-2	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	Note 1

Note 1. Not used in all models.
Note 2. Some models use 56MMF in this application.
Note 3. Not used in chassis with serial numbers lower than 47610.
* Items C62A, C62B, C62C, R62A, R62B, R62C are combined in one unit.
† Items C56A, C56B, C56C, R53A, R53B are combined in one unit.
When replacing items separately, C53B, C53C should total 250 MMF.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	Silvertone PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	750Ω	2	PMB-48015	QJ-415*	RTV-382		WP75I	Contrast-Wire Wound-Panel
B	500KΩ	½					UR55A †	Volume-Rear
C	Switch						US-28	Attach to R1B
R2A	50KΩ	½	PMB-48014-1	Q11-123	AG-44-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-1	Not Req.	Attach to R2A
R3A	250KΩ	½	PMB-48014-3	Q11-130	AG-55-S	AB-50	SU-46	Noise Balance
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	100KΩ	½	PMB-48014-2	Q11-128	AG-49-S	AB-40	U-41	Brightness
B	Shaft		Not Req.	Not Req.	KSS-3	AK-1	Not Req.	Attach to R4A
R5A	2.5Meg	½	PMB-48014-5	Q11-139	AG-84-S	AB-83	SU-565	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	1.5Meg	½	PMB-48014-7	Q11-138	AG-83-S	AB-75	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-1	Not Req.	Attach to R6A
R7A	5000Ω	½	PMA-48016	QJ-114	AG-19-S	AB-10	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A

* CONCENTRIKIT EQUIVALENT - KIT K-3, BASE ELEMENTS & SHAFTS W11-105 & P3-114 (Panel) R13-133 & R1-205 (Rear) & SWITCH 78-1.
† UNIVERSAL REPLACEMENT (MALLORY EXACT DUPLICATE PART NO. UE21W3).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	Silvertone PART No.	IRC PART No.	NOTES
R5	15KΩ	½			
R9	47KΩ	½			
R10	220KΩ	½		BTS-220K	
R11	470Ω	½		BTS-470	
R12	180KΩ	½		BTS-180K	
R13	10KΩ	½			
R14	220KΩ	½			
R15	15KΩ	½			
R16	10KΩ	½			
R17	15KΩ	½			
R18	150Ω	½	PMA-45015-153	BTS-150	
R19	4700Ω	½	PMA-45015-47	BTS-4700	
R20	47Ω	½	PMA-45015-9		
R21	1000Ω	½	PMA-45015-25	BTS-1000	
R22	330Ω	½	PMA-45015-19	BTS-330	
R23	10KΩ	½	PMA-45015-37		
R24	47Ω	½	PMA-45015-9		
R25	1000Ω	½	PMA-45015-25	BTS-1000	
R26	7500Ω-5%	½	PMA-45016-70		
R27	150Ω	½	PMA-45015-15	BTS-150	
R28	4700Ω	2	PMA-45019-33	BTS-4700	
R29	4700Ω	2	PMA-45019-33	BTS-4700	
R30	330KΩ	½	PMA-45015-53	BTS-330K	
R31	100KΩ	½	PMA-45015-49	BTS-100K	
R32	27KΩ	½	PMA-45015-42	BTS-27K	
R33	4700Ω	½	PMA-45015-33	BTS-4700	
R34	1 Meg	½	PMA-45015-61	BTS-1 Meg	
R35	2200Ω	½	PMA-45015-22	BTS-2200	
R36	100KΩ	½	PMA-45015-49	BTS-100K	
R37	6800Ω	2	PMA-45019-33	BTS-6800	
R38	39KΩ	½	PMA-45015-44	BTS-39K	
R39	100KΩ	½	PMA-45015-49	BTS-100K	
R40	270KΩ	½	PMA-45015-54	BTS-270K	
R41	10KΩ	½	PMA-45015-37	BTS-10K	
R42	39KΩ	½	PMA-45015-44	BTS-39K	
R43	390KΩ	½	PMA-45015-59	BTS-390K	
R44	100KΩ	½	PMA-45015-49	BTS-100K	
R45	100KΩ	½	PMA-45015-49	BTS-100K	
R46	82Ω	½	PMA-45015-12	BTS-82	
R47	1000Ω	½	PMA-45015-25	BTS-1000	
R48	270Ω	½	PMA-45015-18	BTS-270	
R49	47KΩ	½	PMA-45015-45	BTS-47K	
R50	10KΩ	½	PMA-45015-37	BTS-10K	
R51	10KΩ	½	PMA-45015-37	BTS-10K	
R52	10 Meg	½	PMA-45015-73	BTS-10 Meg	
R53A	500KΩ	½	†PMA-95001		
B	500KΩ	½			
R54	330Ω	½	PMA-45017-19	BTA-330	
R55	820Ω	½	PMA-45019-24	BTB-820	
R56	470KΩ	½	PMA-45015-57	BTS-470K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	Silvertone PART No.	IRC PART No.	NOTES
R57	4.7Meg	½	PMA-45015-69	BTS-4.7Meg	
R58	470KΩ	½	PMA-45015-57	BTS-470K	
R59	27KΩ	½	PMA-45015-30	BTS-2700	
R60	1800Ω	½	PMA-45015-28	BTS-1800	
R61	2200Ω	½	PMA-45015-29	BTS-2200	
R62A	22KΩ	½		BTS-22K	
B	8200Ω	½	*PMA-95000	BTS-8200	
C	8200Ω	½		BTS-8200	
R63	820KΩ	½	PMA-45015-60	BTS-820K	
R64	150KΩ	½	PMA-45015-51	BTS-150K	
R65	270KΩ	½	PMA-45015-54	BTS-270K	
R66	47KΩ	½	PMA-45015-45	BTS-47K	
R67	8200Ω	½	PMA-45015-36	BTS-8200	
R68	2200Ω	½	PMA-45015-29	BTS-2200	
R69	1 Meg	½	PMA-45015-61	BTS-1 Meg	
R70	470Ω	½	PMA-45015-21	BTS-470	
R71	47Ω	½	PMA-45015-9		
R72	120KΩ	1	PMA-45017-50	BTA-120K	
R73	68KΩ	1	PMA-45017-47	BTA-68K	
R74	820KΩ	1	PMA-45015-60	BTS-820K	
R75	150KΩ	1	PMA-45017-51	BTA-150K	
R76	150KΩ	1	PMA-45017-51	BTA-150K	
R77	8200Ω	½	PMA-45015-36	BTS-8200	
R78	2.7Meg	1	PMA-45017-66	BTA-2.7Meg	
R79	100KΩ	1	PMA-45017-49	BTA-100K	
R80	8200Ω	½	PMA-45015-36	BTS-8200	
R81	68KΩ	1	PMA-45017-47	BTA-68K	
R82	10KΩ	½	PMA-45015-37	BTS-10K	
R83	150KΩ	½	PMA-45015-51	BTS-150K	
R84	100KΩ	1	PMA-45015-49	BTS-100K	
R85	470KΩ	2	PMA-45015-57	BTS-470K	
R86	220Ω	4	PMB-47007-3	1 3/4A-225	
R87	6800Ω	2	PMA-45019-35	BTS-6800	
R88	1000Ω	1	PMA-45017-25	BTA-1000	
R89	3.3Ω	1	PMA-45013-1		
R90	470KΩ	1	PMA-45017-57		
R91	60Ω	0	PMB-47007-4		
R92	250Ω	15	PMB-47007-5	2D-250	
R93	1000Ω	7.5	PMB-47007-1	1 3/4A-1000	
R94	1000Ω	7.5	PMB-47007-1	1 3/4A-1000	
R95	27KΩ	1	PMA-45017-42	BTA-27K	
R96	220KΩ	½	PMA-45015-54	BTS-220K	

† Items R53A, R53B, C56A, C56B, C56C are combined in one unit.
* Items R62A, R62B, R62C, C62A, C62B, C62C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	Silvertone PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ 1.83A	700VCT .220ADC	5VAC @ 3A	6.3VAC @ 3A	PMB5003				
			SEC. 4	SEC. 5					
			6.3VAC @ 1.2A	6.3VAC @ 6.9A					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	Silvertone PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	18Ω	100Ω	PMA-56005-2	A-8111	A-3000	TSO-5 ②	A-97X ②	Vert. Osc. Trans.
T3	440Ω tap ⑤ 20Ω	35Ω tap ⑤ 4Ω, 11.7Ω, 31.2Ω SEC. 2 0Ω	PMC-56002		HVO-8 ①	TFB-18	D-19 ③	Horiz. Output Trans.
T4	1500Ω tap ⑤ 5Ω		PMA-56004	A-8141	A-3039	TSO-12	A-104X	Vert. Output Trans.
T5A	24Ω		PMA-56000	DY-9A	MDF-73	TY-3 ④	Y-17	Horiz. Deflection Coils
B	45Ω							Vert. Deflection Coils

① Do not connect terminal 8 to terminal 7.
② Drill one new mounting hole.
③ Wire as in original circuit (no connection to D-19 terminal "T")
④ Use original deflection coil network.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	Silvertone PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	7.5KΩ	3-4Ω	425Ω	.6Ω	PMB-51005	A-3878	A-2931	RO-13	S-9X	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	Silvertone PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coils	0Ω CT	0Ω					
L2	Fil. Choke	0Ω						
L3	Neutralizing Coil	0Ω						
L4	RF, Mixer Grid & Osc. Coils	0Ω						
L5	Fil. Choke	0Ω						
L6	RF Choke	0Ω						
L7	Conv. Plate	.6Ω						
L8	RF Choke	.4Ω						
L9	1st, Video IF	.3Ω		PMA-52021	17-1003	TV-112 *	6171 *	
L10	21.6MC Trap	.2Ω		PMA-52026	20-1021 †	TV-150 ▲	6193 ▲	
L11	2nd, Video IF	.4Ω	.4Ω	PMA-52029	17-1003	TV-116	6250	
L12	3rd, Video IF	.3Ω		PMA-52031	17-1004	TV-122 *	6189 *	
L13	4th, Video IF	.4Ω	.4Ω	PMA-52029-2	17-1063	TV-116	6249	
L14	Series Peaking Coil	3.4Ω		PMA-52023	19-3093	TV-181	4642	100 Microhenries
L15	Shunt Peaking Coil	11Ω		PMA-52024	19-3500	TV-188	4566	450 Microhenries
L16	4.5MC Trap	1.9Ω		PMA-52038-2	20-1004	TV-151	1470	
L17	Series Peaking Coil	6.8Ω		PMA-52025	19-3180 ▲	TV-184 ▲	6154 ▲	200 Microhenries, Wound on 22KΩ resistor
L18	Shunt Peaking Coil	11Ω		PMA-52024	19-3500	TV-188	4566	450 Microhenries
L19	Sound IF	1.9Ω		PMA-52038-2	17-3400	TV-151	1469	
L20	Ratio Det.	5.5Ω	.9Ω CT	PMA-52027	17-3497	TV-115	6205	Tertiary winding - .55Ω
L21	Horiz. Osc.	85Ω		PMB-53019	20-1402	TV-162	6183	Pri. tapped ⑤ 22Ω, horiz. waveform winding - 47Ω
L22	Width Coil	8Ω		PMA-56003				

* Enlarge mounting hole.
† Use one winding
▲ Use one winding and enlarge mounting hole.
▪ Parallel with 22KΩ resistor

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP	Silvertone PART No.	JENSEN PART No.	QUAM PART No	NOTES
SP1	8"	PM	3-4Ω		ST-115 Mod. P8-V	8A21	

FUSES

ITEM No.	TYPE	RATING	Silvertone PART No. FUSE	Silvertone PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1/4A 250V			312-250 (3AG-1/4A)	375001	AGC-1/4	440§

MISCELLANEOUS

ITEM No.	PART NAME	Silvertone PART No.	NOTES
M2A	RF Tuner	PMB 57002	Model 2181
B	RF Tuner		Model 2081
M3	Focus Magnet		Model 2081 and Model 2181 when using chassis #150-31.
M4	Centering Magnet		Models 2081 and 2181.
M5	Ion Trap		Models 2081 and 2181.
	Trimmer	PMA-43001	Horizontal locking range, horizontal drive @ 180 MMF, 80-480MMF.

PHONO CARTRIDGE

ITEM No.	Silvertone PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M6		GC-AG-J	G-AG	WC56B	A56U	43	0-2 or 0-3	

ASTATIC SHURE AND ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	Silvertone PART No.	WALCO PART No.	JENSEN PART No.	REMARKS
NT1		W-3AGA or W-3AGS	S-642 or S-652	

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	Silvertone PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V22	Converter	6BE6	6BE6	7CH	
V23	IF Amplifier	6BA6	6BA6	7BK	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C91	.05	400	PMB-41006-30	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C92	.02	200	PMB-41006-21							
C93	.01	600	PMB-41006-45	P688-01	D6-103	PTE6S1	GP2-333-103	PT61I	6TM-S1	
C94	.05	600	PMB-41006-49	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C95	100		PMB-40518-14	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	

CONTROLS

ITEM No	RATING RESIST-ANCE	RATING WATTS	Silvertone PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R97A	50Ω	½	PMB-48018-1	Q13-123	AG-46-S	B-33	U-33	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R97A

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	Silvertone PART No.	IRC PART No.	NOTES
R98	22KΩ	½	PMB-45015-41	BTS 22K	
R99	2.2Meg	½	PMB-45015-65	BTS-2.2Meg	
R100	150Ω	½	PMA-45015-15	BTS-150	
R101	10KΩ	2	PMB 45019-37	BTB-10K	

ITEM No.	RATING OHMS	RATING WATT	Silvertone PART No.	IRC PART No.	NOTES
R102	8200Ω	2	PMB-45019-36	BTB-8200	
R103	47KΩ	½	PMB-45015-45	BTS-47K	
R104	470KΩ	½	PMA-45015-57	BTS-470K	

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: MEISSNER PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: MILLER PART No.	NOTES
L23	Loop Ant.	.6Ω		PMB-52034				
L24	Osc. Coil	4.2Ω		PMA-52032	14-1060 ♦		71-Osc.♦	Tapped @ 4Ω
L25	Input IF	14.5Ω	14.5Ω	PMD-52033-1	16-6758	BC-352	12-C1	
L26	Output IF	14.5Ω	14.5Ω	PMD-52033-2	16-6758	BC-353	12-C2	

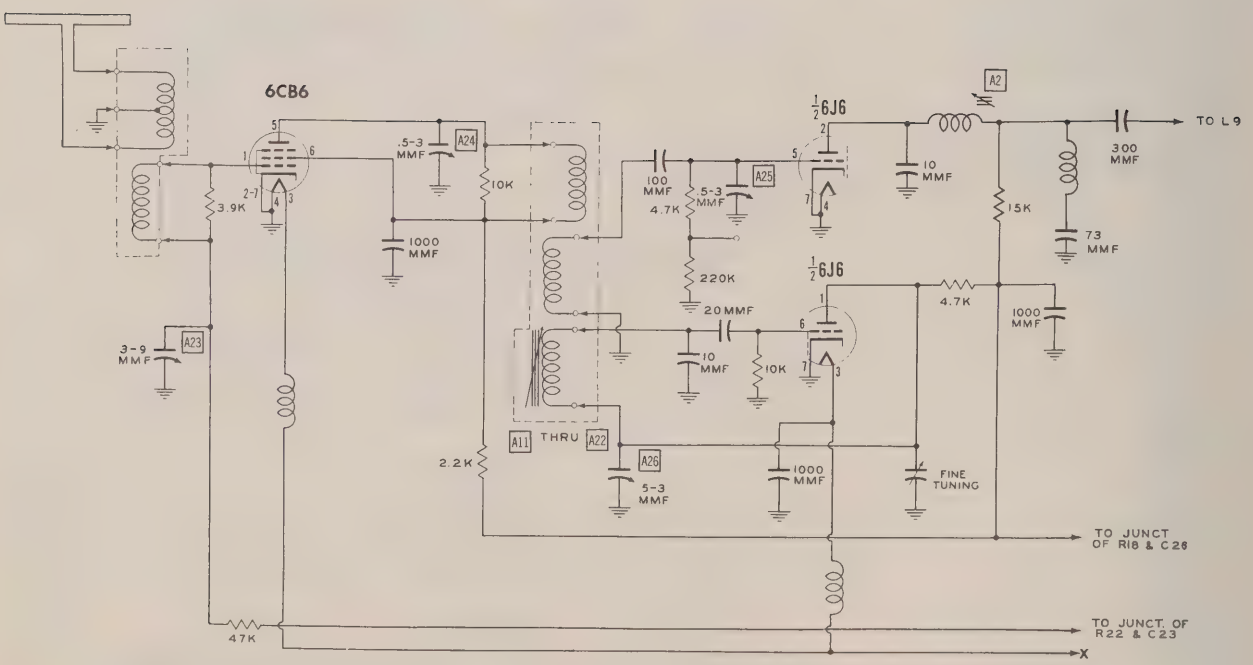
♦ Use primary winding only.

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: Silvertone PART No.	REPLACEMENT DATA	NOTES
M8	Bayonet	6-8	.15	Brown			Type No. 47

MISCELLANEOUS

ITEM No.	PART NAME	Silvertone PART No.	NOTES
M9	Crystal		1N65
M10	Switch	PMB-60006	Radio-TV-Phono
M11	Tuning Capacitor	PMB-44001	45-482MMF, 14-190MMF



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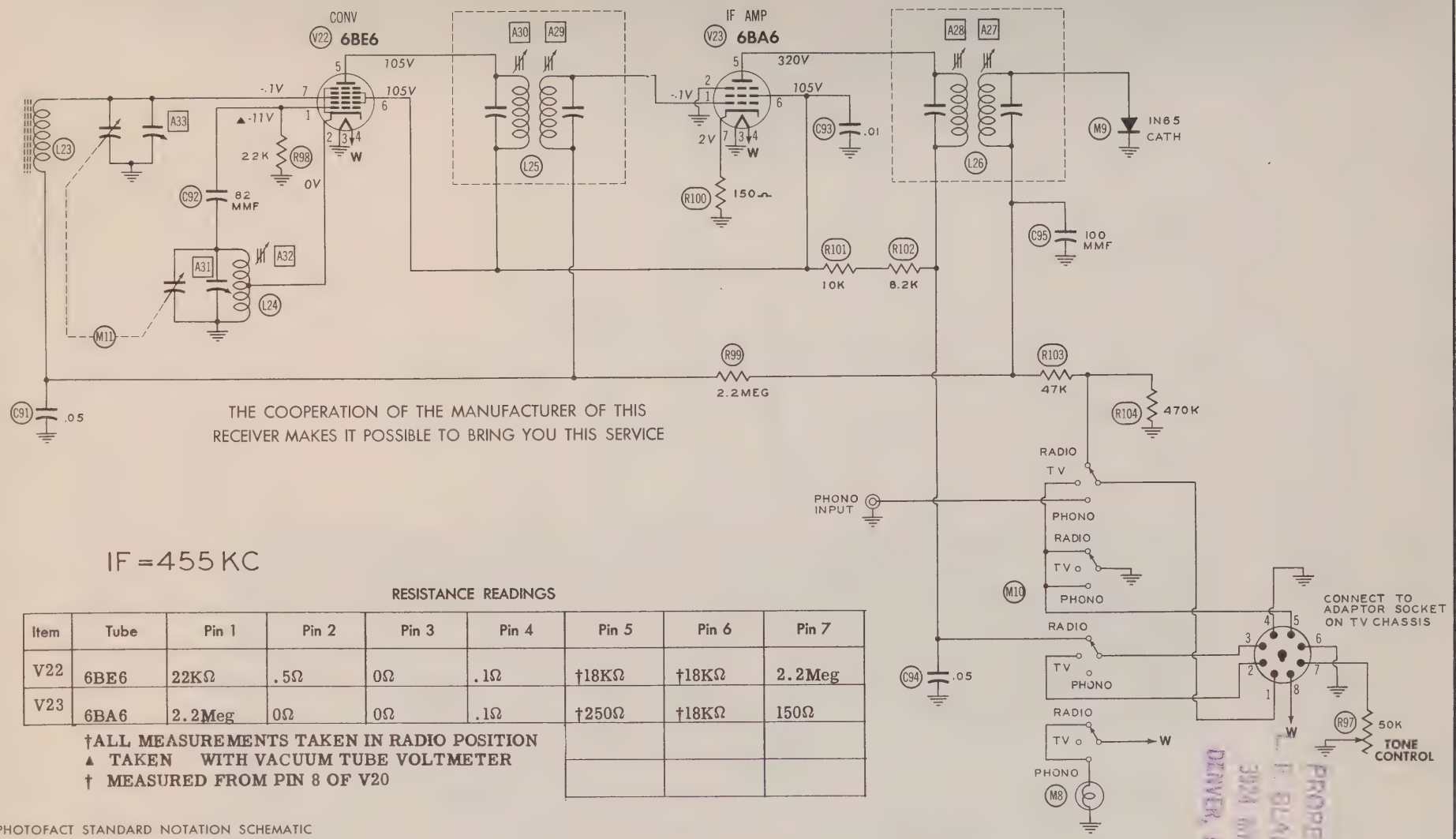
ALTERNATE TUNER SCHEMATIC



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF = 455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V22	6BE6	22KΩ	.5Ω	0Ω	.1Ω	†18KΩ	†18KΩ	2.2Meg
V23	6BA6	2.2Meg	0Ω	0Ω	.1Ω	†250Ω	†18KΩ	150Ω

†ALL MEASUREMENTS TAKEN IN RADIO POSITION
▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 8 OF V20

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PROPERTY OF
F. BLANKENSHIP
3324 WADE ST
DENVER, COLORADO

RADIO SCHEMATIC

SILVERTONE MODELS 2276, 2277, 3276, 3277 (Ch. 456.150-14, -18, -61)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

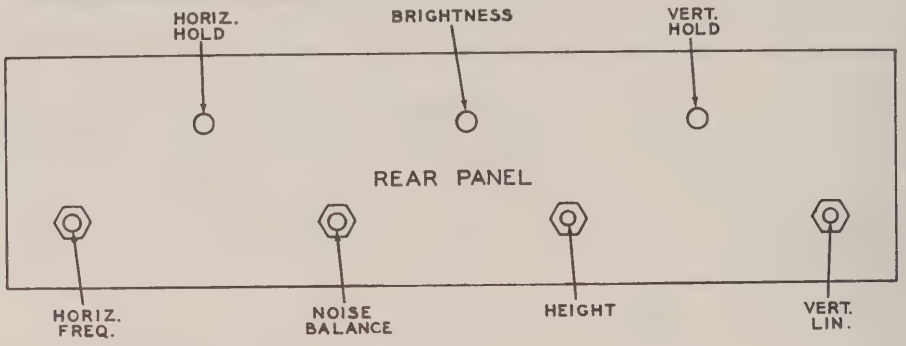
PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws and 2 wood strips (1 on each side of safety glass). Remove safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - NOISE BALANCE CONTROL

Adjustment of noise balance control can be made from the front panel. For correct adjustment see Horiz. Sweep Circuit Adj. on page 11.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator slug (L21) can be made from the front panel. For correct adjustment see Horiz. Sweep Circuit Adj. on page 11.

SOUND IF DETECTOR BUZZ ADJUSTMENT

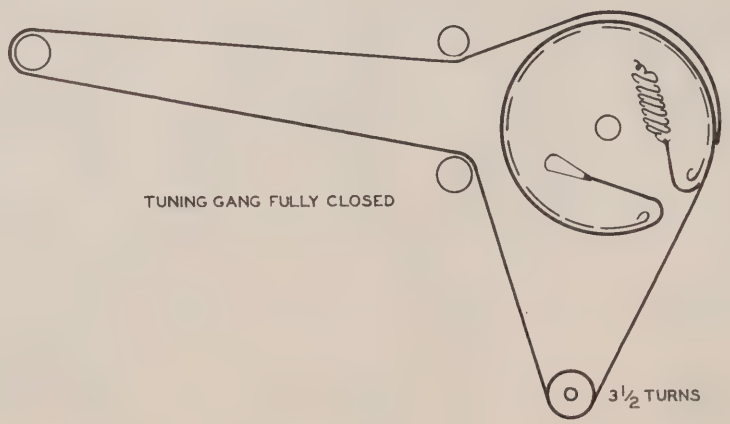
To eliminate Sound IF Detector buzz, adjust the Ratio Detector Secondary (L20) located on top of chassis. (See tube placement chart).

FUSES

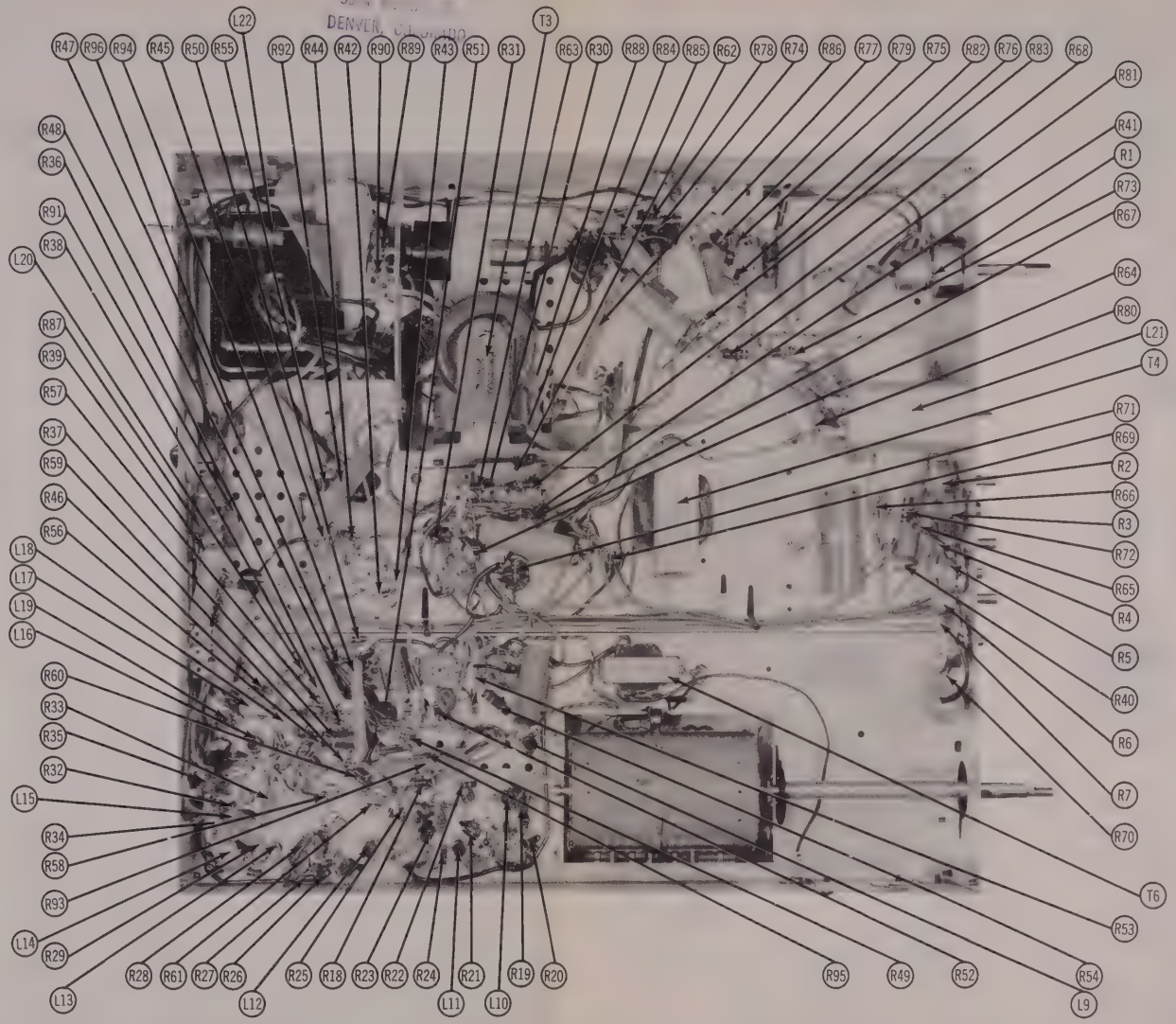
One fuse is used for Horiz. Sweep Circuit protection. For location see tube placement chart.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube located flush against the yoke. Rotate the two rings around the neck of the picture tube until proper centering of picture is obtained.



RADIO DRIVE CORD STRINGING



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. F. [illegible]
3524 [illegible] ST.
DENVER, COLORADO

STEWART-WARNER
MODELS 9170-B, -C, -D

TRADE NAME	Stewart-Warner Models 9170-B, -C, -D
MANUFACTURER	Stewart-Warner Electric, Div. of Stewart-Warner Corp., 1300 N. Kostner Ave., Chicago 15, Ill.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3S4 Audio Output
POWER SUPPLY	110-120 Volts AC/DC (or) 3 Volts "A" Supply & 67½ Volts "B" Supply
RATING	.1 Amp. @ 117 Volts AC (or) 150MA @ 3 Volts DC & 8MA @ 67½ Volts DC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher tha n necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400~Mod)	Any non-interfering point	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	Reassemble chassis in cabinet. Batteries should be in place for accurate aligment. With tuning gang fully closed the dot, under the small "5" of "55" on the dial should be directly opposite the gold index mark on the cabinet.						
3.		Loop	1600KC	1600KC	Across voice coil	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1500KC	1500KC	"	A6	"

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PARTS LIST AND DESCRIPTIONS

STEWART-WARNER MODEL 9170-B

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Stewart Warner PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3S4	3S4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Stewart-Warner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■40	150	521193					FP314	R1440	
B	▲40	150								
C	250	15								
C2	.05	400	512214	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C3	.1	400	512217	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C4	470		513008	SI471	D6-471		GP1K-471	UC-5347	5GA-T47	
C5	47		513002	SI470	D6-470		GP1K-470	UC-5447	5GA-Q47	
C6	10000		513022	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C7	10000		513022	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C8A	150					TM5T15	GP1K-151	UC-5315	5GA-T15	
B	2000					TM5D2	812-002	DC-522	5HK-D2	
C	10000		*521305	*PA-136	*PC-165	TM5S1	811-01	DC-511	5HK-S1	
D	150					TM5T15	GP1K-151	UC-5315	5GA-T15	
E	5000					TM5D5	811-005	DC-525	5HK-D5	
C9	1500		513010	SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5GA-D15	
C10	.05	400	512214	P488-05		PTE4S5		PT415	4TM-S5	
C11	.05	400	512214	P488-05		PTE4S5		PT415	4TM-S5	

Items C8A, C8B, C8C, C8D, C8E, R8A, R8B, R8C and R8D are combined in one unit.

CONTROLS

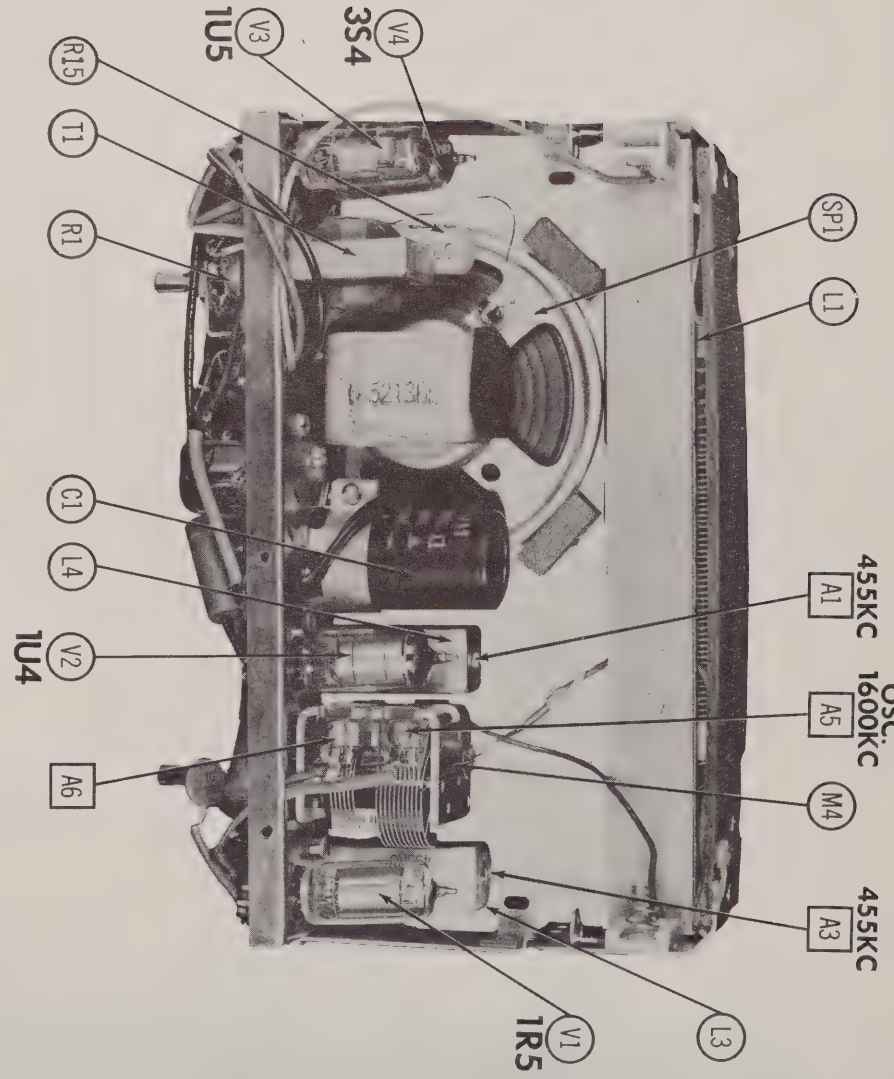
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Stewart-Warner PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	521218	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Stewart Warner PART No.	IRC PART No.	
R2	4.7Meg	½	510195	BTS-4.7Meg	
R3	390Ω	½	510129	BTS-390	
R4	100KΩ	½	510173	BTS-100K	
R5	22KΩ	½	510161	BTS-22K	
R6	10Meg	½	510197	BTS-10Meg	
R7	3.3Meg	½	510194	BTS-3.3Meg	
R8A	10Meg	½	* 521305	BTS-10Meg	
B	4.7Meg	½		BTS-4.7Meg	
C	1Meg	½		BTS-1Meg	
D	3.3Meg	½		BTS-3.3Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Stewart Warner PART No.	IRC PART No.	
R9	270Ω	½	510126	BTS-270	
R10	680Ω	½	510133	BTS-680	
R11	3300Ω	½	510146	BTS-3300	
R12	27Ω	½	510108	BTS-27	
R13	220KΩ	½	510179	BTS-220K	
R14	680Ω	½	510133	BTS-680	
R15A	2000Ω	7	521210		
B	150Ω	3			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		Steward Warner PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	7.3KΩ	3.1Ω	526Ω	.45Ω	521266	A-3329 ①	A-2927 ①			① Bend mounting tabs down. File out slots. Mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Stewart Warner PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.1Ω	521365	ST-113 Mod P4-X	4A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Stewart-Warner PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.6Ω		521375				Includes mtg. band
L2	Osc. Coil	2Ω	9Ω	521224	14-1060		71-Osc.	
L3	Input IF	23Ω	23Ω	521318	16-6758	BC-352	12-C1	
L4	Output IF	42Ω	42Ω	521319	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	Stewart Warner PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.06A	508305	5M4	1003	6S75	75	

BATTERIES

ITEM No.	VOLTAGE	Stewart Warner PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	1.5V		964			21R			Two in series
M3	67.5V			477			P45		

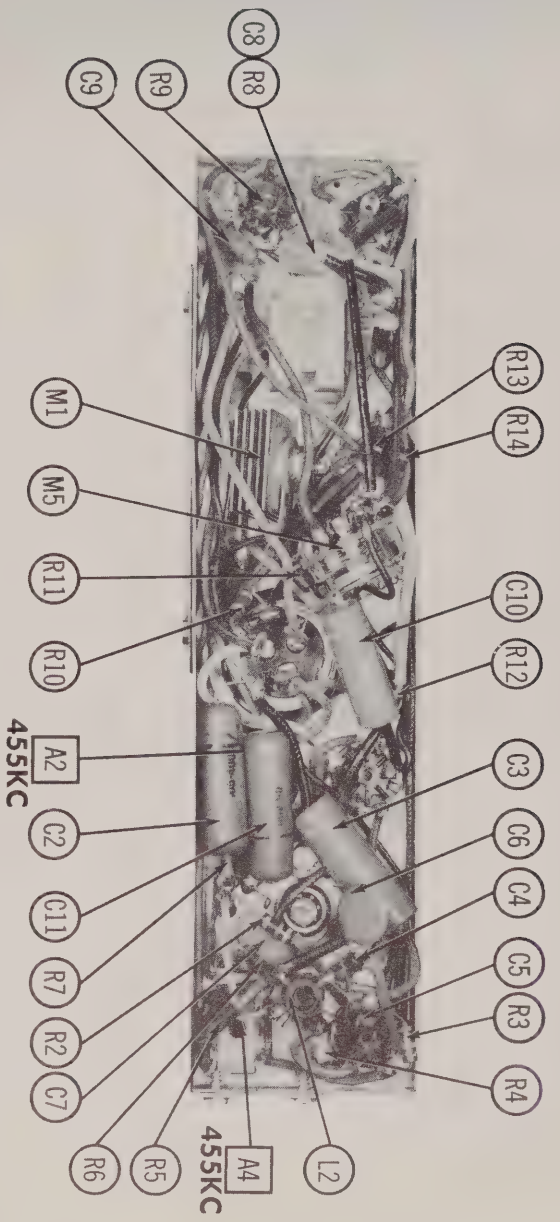
MISCELLANEOUS

ITEM No.	PART NAME	Stewart-Warner PART No.	NOTES
M4	Tuning Cap.	521294	
M5	Switch	521293	Power Selector
	Cabinet	521668	Green - Model 9170B- Front section
	Cabinet	521670	Gray - Model 9170C - Front section
	Cabinet	521672	Maroon - Model 9710D - Front section
	Cabinet	521669	Green - Model 9170B - Back section
	Cabinet	521671	Gray - Model 9170C - Back section
	Cabinet	521673	Maroon - Model 9170D - Back section
	Handle	521273	Plastic
	Knob	521351	Off/on / Volume
	Knob	521350	Tuning

SET 230 FOLDER 11

STEWART-WARNER MODEL 9170-B

CHASSIS—BOTTOM VIEW



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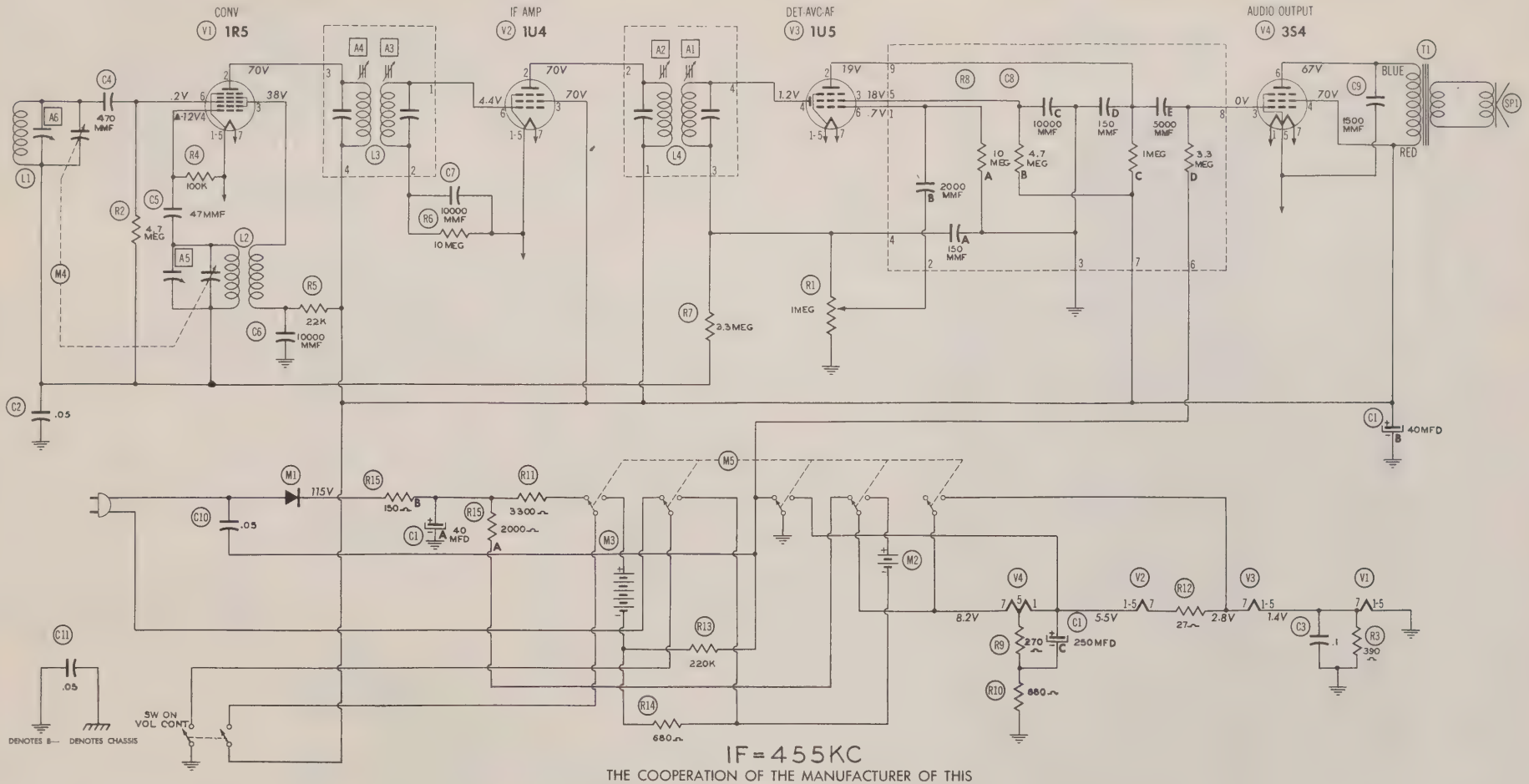
STEWART-WARNER
MODEL 9170-B



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0Ω	†3.5KΩ	†25KΩ	100KΩ	0Ω	9Meg	*
V 2	1U4	*	†3.5KΩ	†3.5KΩ	0Ω	*	10Meg	*
V 3	1U5	*	†1Meg	†4.7Meg	1Meg	INF	10Meg	*
V 4	3S4	*	†4KΩ	3.3Meg	†3.5KΩ	*	†4KΩ	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1

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230-11

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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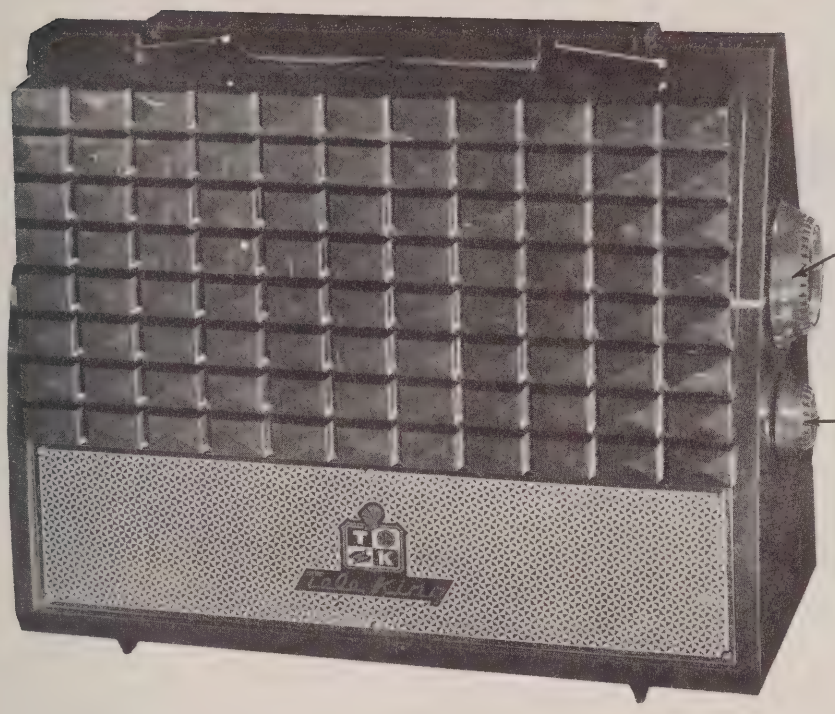
TELEKING
MODEL RKP-53-A



TELEKING
MODEL RKP-53-A

TRADE NAME	Teleking Model RKP-53-A
MANUFACTURER	Teleking Corp., 601 W. 26th. St., New York 1, N.Y.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC-DC (or) 7½ Volts "A" Supply & 90 Volts "B" Supply in Pack Form
RATING	.15 Amp. @ 117 Volts AC (or) 50MA @ 7.5 Volts DC & 12MA @ 90 Volts DC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator lug of tuning gang. Low side to B-	455KC (400%Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"
4.	Repeat steps 2 and 3.						

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PARTS LIST AND DESCRIPTIONS

TELEKING
MODEL RKP-53-A

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: TELEKING PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TELEKING PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■30	150		AFH2-15		BO15		FP314	TVL-2432	
B	▲50	150		PRS25/250		BRH2525		TC2501	TVA-1208	
C	300	25								
C2	.01	200		P285-01	D6-103	PJ2S1	GP2-333-103	PT4S1	2TM-S1	
C3	100									
C4	.002	600		P685-002	D6-202	PJ6D2	GP2-333-202	PT622	6TM-S2	
C5	3			SI3NP0	TCZ-3.3				5TCCB-V33	
C6	220			SI220	D6-221			UC-5322	5GA-T22	
C7	.001	200		P285-001	D6-102	PJ4D1	GP2L-102	PT421	2TM-D1	
C8	.01	200		P285-01	D6-103	PJ2S1	GP2-333-103	PT411	2TM-S1	
C9	100			SI100	D6-101	TM5T1		UC-531	5GA-T1	
C10	.0047	200		P285-0047	D6-472	PJ4D47	GP2-333-472	PT4247	2TM-D47	
C11	.05	200		P285-05	DF-503	PJ2S5		PT415	2TM-S5	
C12	.05	200		P285-05	DF-503	PJ2S5		PT415	2TM-S5	
C13	.0022	600		P685-002	D6-202	PJ6D2	GP2-333-202	PT622	6TM-D2	
C14	.047	400		P485-047		PJ4S47		PT4147	4TM-S47	
C15	.05	200		P485-05		PJ4S5		PT415	4TM-S5	
C16	.01	200		P285-01	D6-103	PJ2S1	GP2-333-103	PT411	2TM-S1	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TELEKING PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	P27	Q13-137	AG-63-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

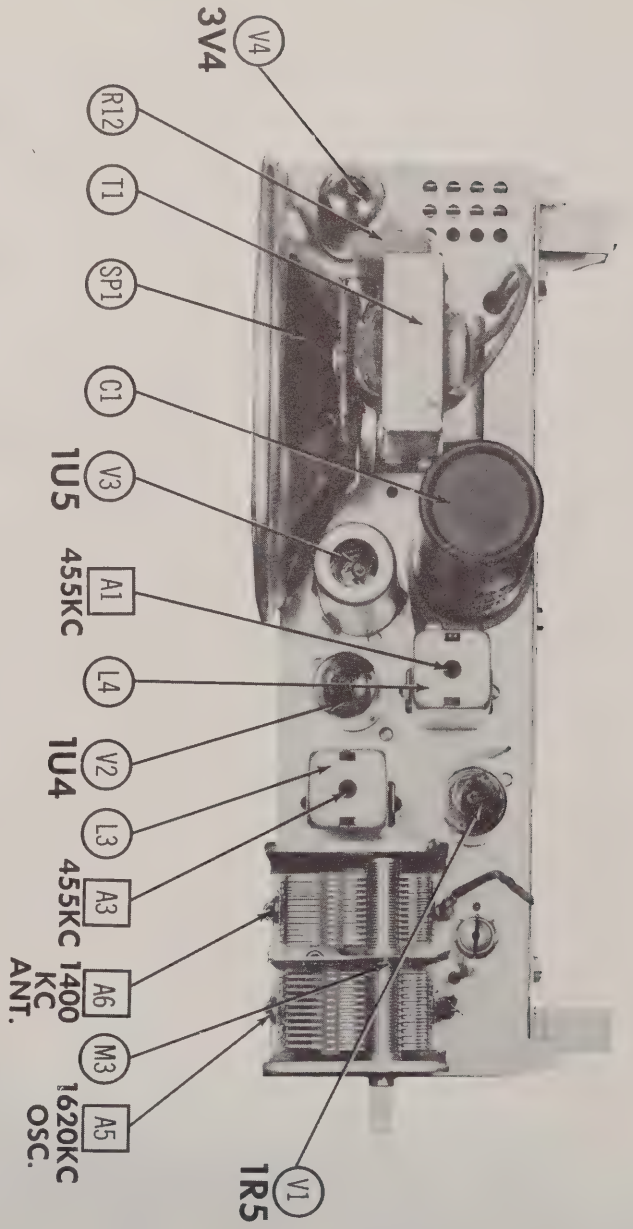
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TELEKING PART No.	IRC PART No.	NOTES
R2	100KΩ	½		BTS-100K	
R3	27KΩ	½		BTS-27K	
R4	10Meg	½		BTS-10Meg	
R5	3. 3Meg	½		BTS-3. 3Meg	
R6	10Meg	½		BTS-10Meg	
R7	1. 5Meg	½		BTS-1. 5Meg	
R8	470KΩ	½		BTS-470K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TELEKING PART No.	IRC PART No.	NOTES
R9	2. 2Meg	½		BTS-2. 2Meg	
R10	27Ω	2			
R11	2200Ω	1		BTA-2200	
R12	2700Ω	10			
R13	1200Ω	½		BTS-1200	
R14	1000Ω	½		BTS-1000	
R15	680Ω	½		BTS-680	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: TELEKING PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	9.6KΩ	3. 6Ω	356Ω	. 4Ω		A-3879 ①	A-2932 ①	R0-16 ①	S-11X ①	① Bend mounting tabs down, file out slots. Mount on original mounting bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TELEKING PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.6Ω		ST-105 Mod P5-X	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	TELEKING PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.6Ω		LA-7				
L2	Osc. Coil	1.9Ω	6Ω		14-1060		70-Osc. *	
L3	Input IF	20Ω	20Ω	L1F-12	16-6758	BC-352	12-C1	
L4	Output IF	20Ω	20Ω	L1F-12	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				
	CURRENT	TELEKING PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.070A		5M4	1003	6S75	75

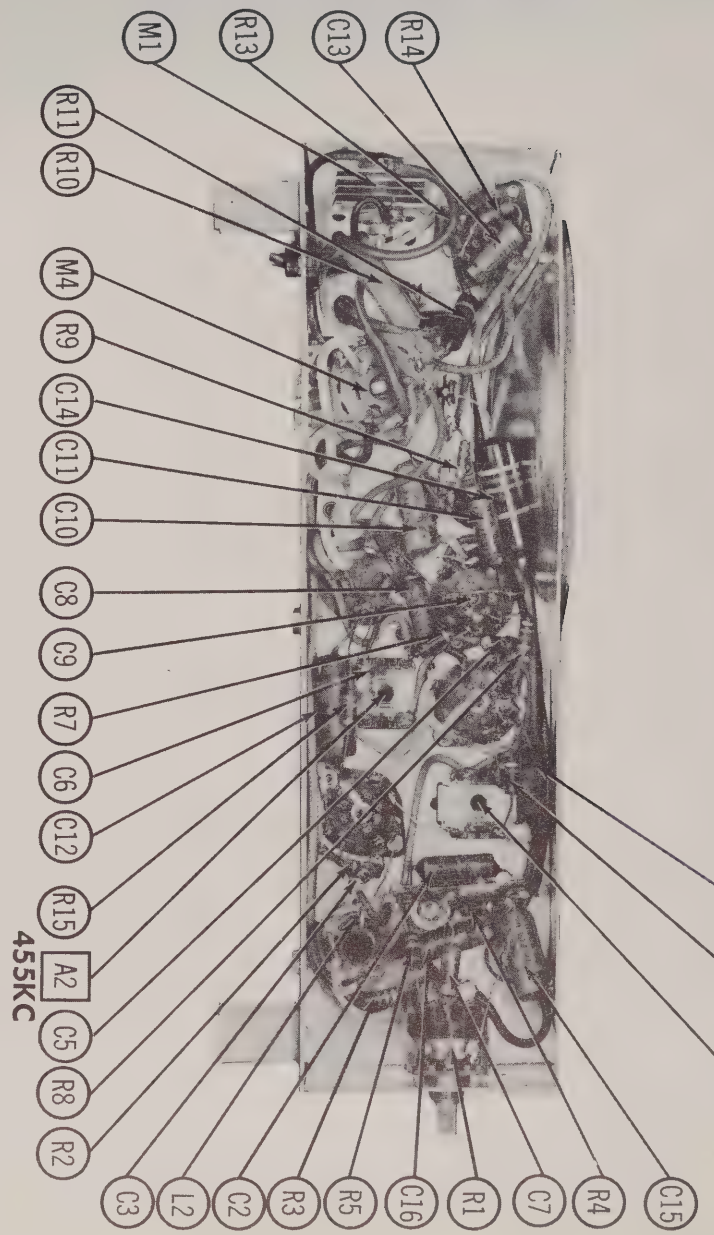
BATTERIES

ITEM No.	VOLTAGE	TELEKING PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	7½ V "A" 90V "B"				756			T6Z60	

MISCELLANEOUS

ITEM No.	PART NAME	TELEKING PART No.	NOTES
M3	Tuning cap		2 gang (35-410MMF, 15-157 MMF)
M4	Switch		Power selector

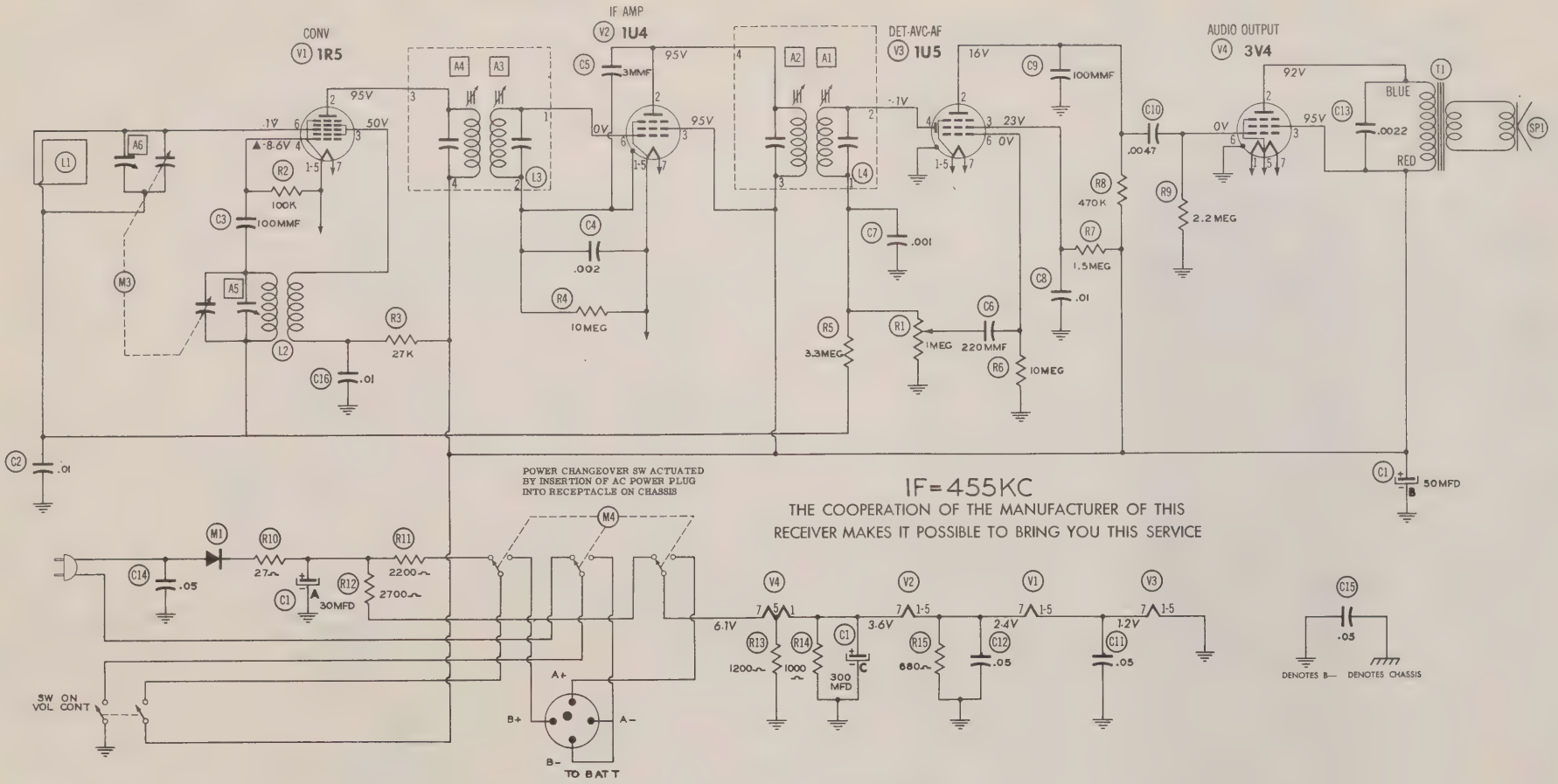
CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. DAMKENSHIP
3824 MEADE ST.
DENVER, COLORADO

TELEKING
MODEL RKP-53-A

TELEKING
MODEL RKP-53-A



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†2.2KΩ	†29KΩ	100KΩ	*	4.3Meg	*
V 2	1U4	*	†2.2KΩ	†2.2KΩ	10Meg	*	10Meg	*
V 3	1U5	*	†470KΩ	†1.5Meg	1Meg	*	10Meg	*
V 4	3V4	*	†2.6KΩ	†2.2KΩ	0Ω	*	2.2Meg	*

▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1 (Selenium Rectifier)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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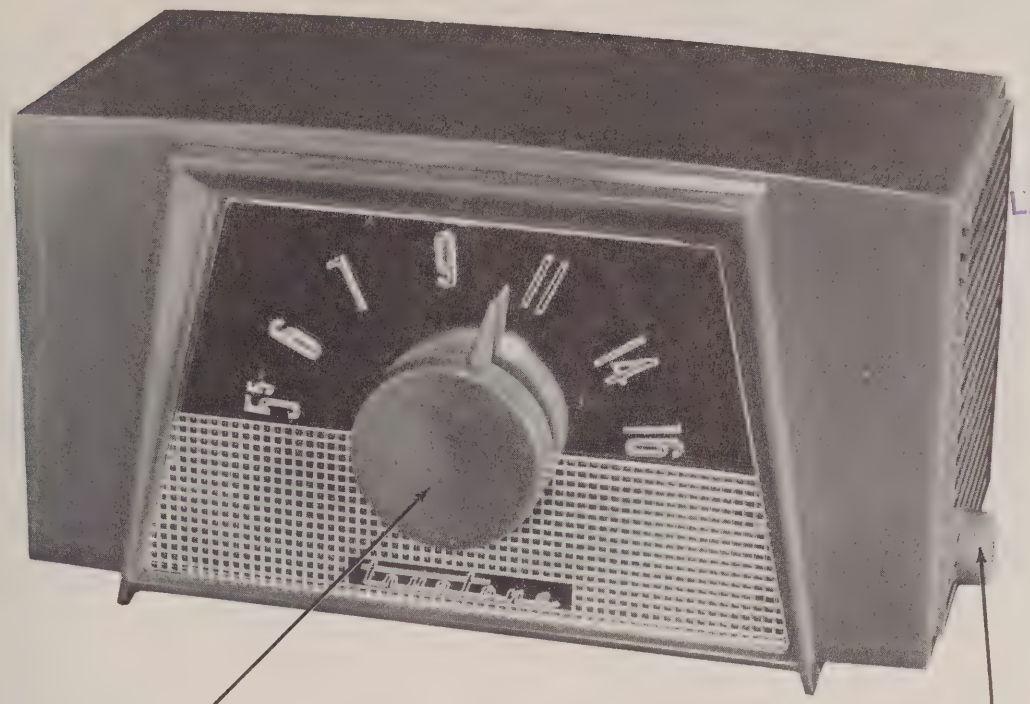
230-12

1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

TRUETONE
MODELS D2386, D2387, D2388



PROPERTY OF
L. F. BL
DENVER, COLORADO

TUNING CONTROL

VOLUME CONTROL ON-OFF SWITCH

TRUETONE
MODELS D2386, D2387, D2388

TRADE NAME	Truetone Model D2386, D2387, D2388
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC-DC Operated AM Superheteroydne Receiver
TUBES (Four)	Types 12BE6 Conv., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Amp., 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	75MMF	High side to antenna terminal on L1. Low side to B-.	1620KC	"	"	A3	Disconnect antenna hank. Adjust for maximum deflection.
3.	"	"	1400KC	Tune to 1400KC signal	"	A4	"
4.	"	"	600KC	Tune to 600KC signal	"		If necessary, fan slotted rotor plates on tuning gang. Repeat steps 2, 3 and 4.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D2386

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		TRUETONE PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	Det-AVC-AF Amp.	12AT6	12AT6	7BT	
V3	Audio Output	50C5	50C5	7CV	
V4	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	70	150	150-107	PRS150/80-40		BBRD8415		3N536	TVA-2460	Red
B	30	150								Blue
C2	.05	200	152-104	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	100		156-102	S1100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C4	2000		158-103	BPD-002	DD-202	TM5D2	812-002	DC-522	5HK-D2	
C5	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C6	.02	400		P488-02		PTE4S2		PT412	4TM-S2	
C7	330	500		1479-00035		5R5T3		MC241	1FM-335	Note 1
C8	.05	400	152-105	P488-05		PTE4S5		PT415	4TM-S5	
C9	.05	400	152-105	P488-05		PTE4S5		PT415	4TM-S5	

Note 1. Not used in all Models.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2Meg with 100K stop	½	120-104	Q13-139 *	AG-66-Z *	AB-76 *	U-55 *	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	KB-1	US-26	Attach to R1A

* Connect a 100KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).

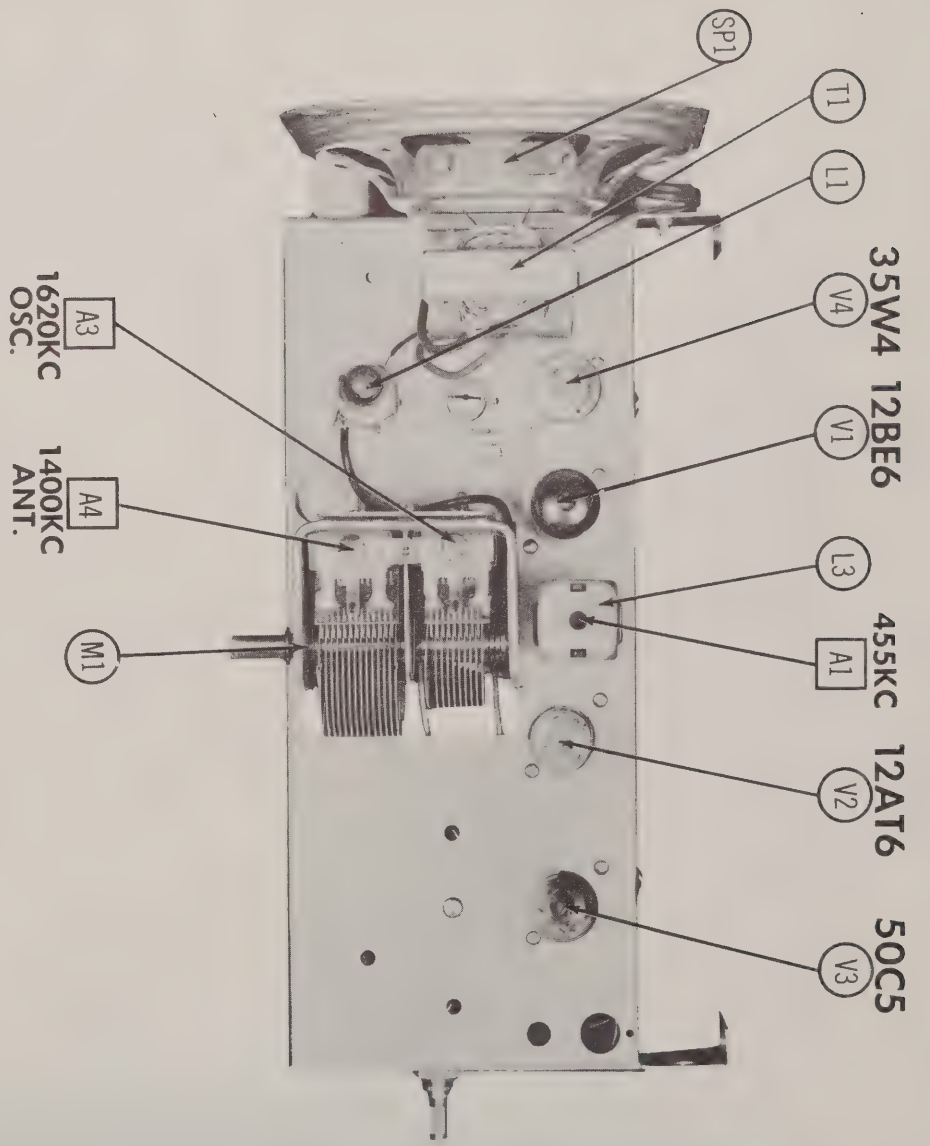
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	Note
R3	4.7Meg	½	180-122	BTS-4.7Meg	
R4	10Meg	½	180-123	BTS-10Meg	
R5	330KΩ	½	180-109	BTS-330K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R6	330KΩ	½	180-109	BTS-330K	
R7	2200Ω	1	180-124	BTA-2200	
R8	22Ω	½	180-113	BTS-22	
R9	68Ω	1	180-125		

Note: Some models may use a 6000Ω and a 15KΩ resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.4KΩ	3.2Ω	152Ω	.45Ω	Part of Spkr	A-3332 ①	A-3025 ①	RO-2 ①	S-1X ①	① Bend mounting tabs down, file out slots, mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	175-105 170-105 ①	ST-113	4A1	① Alternate 4" PM speaker

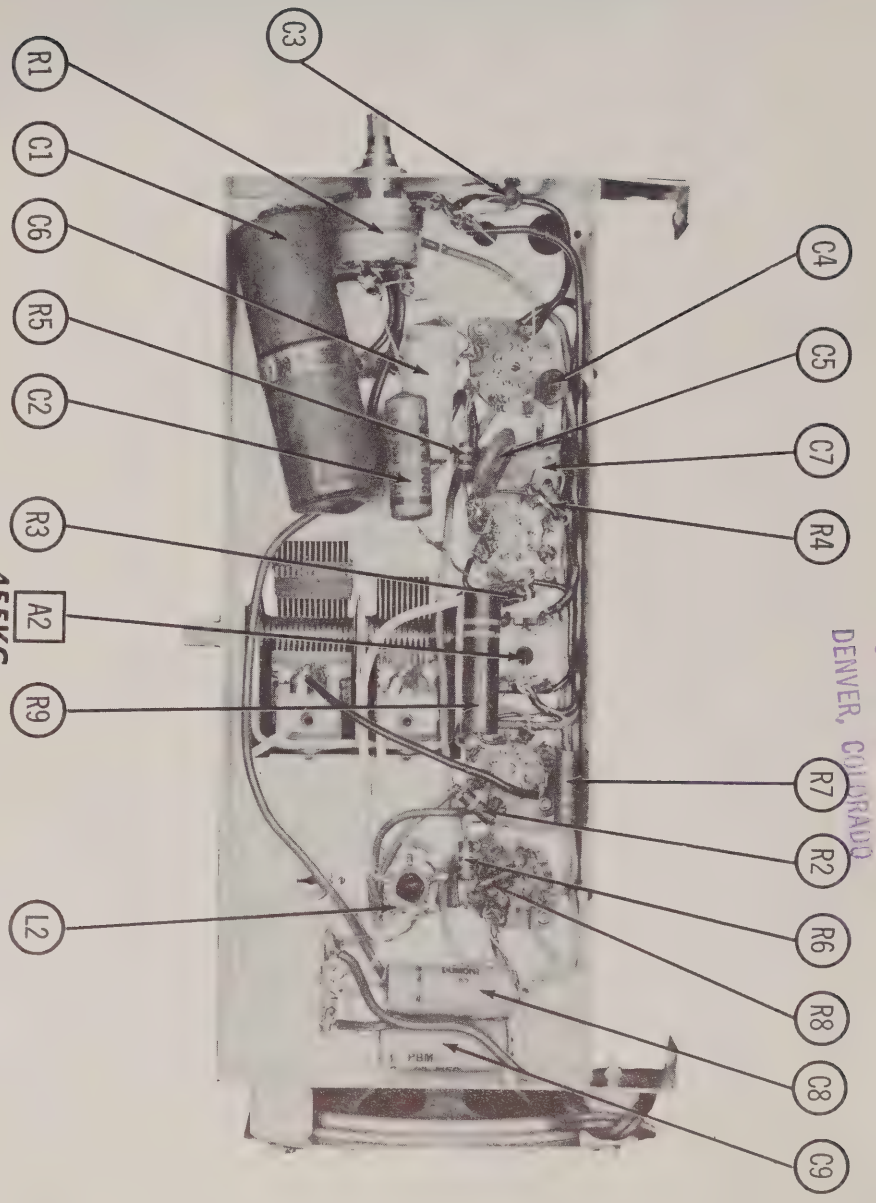
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	70Ω	2.5Ω	132-104				
L2	Osc. Coil	.4Ω	5.5Ω	136-106	14-1073		69-Osc.	
L3	IF Trans.	17Ω	20Ω	130-103				Pri. tapped @ 2.5Ω

MISCELLANEOUS

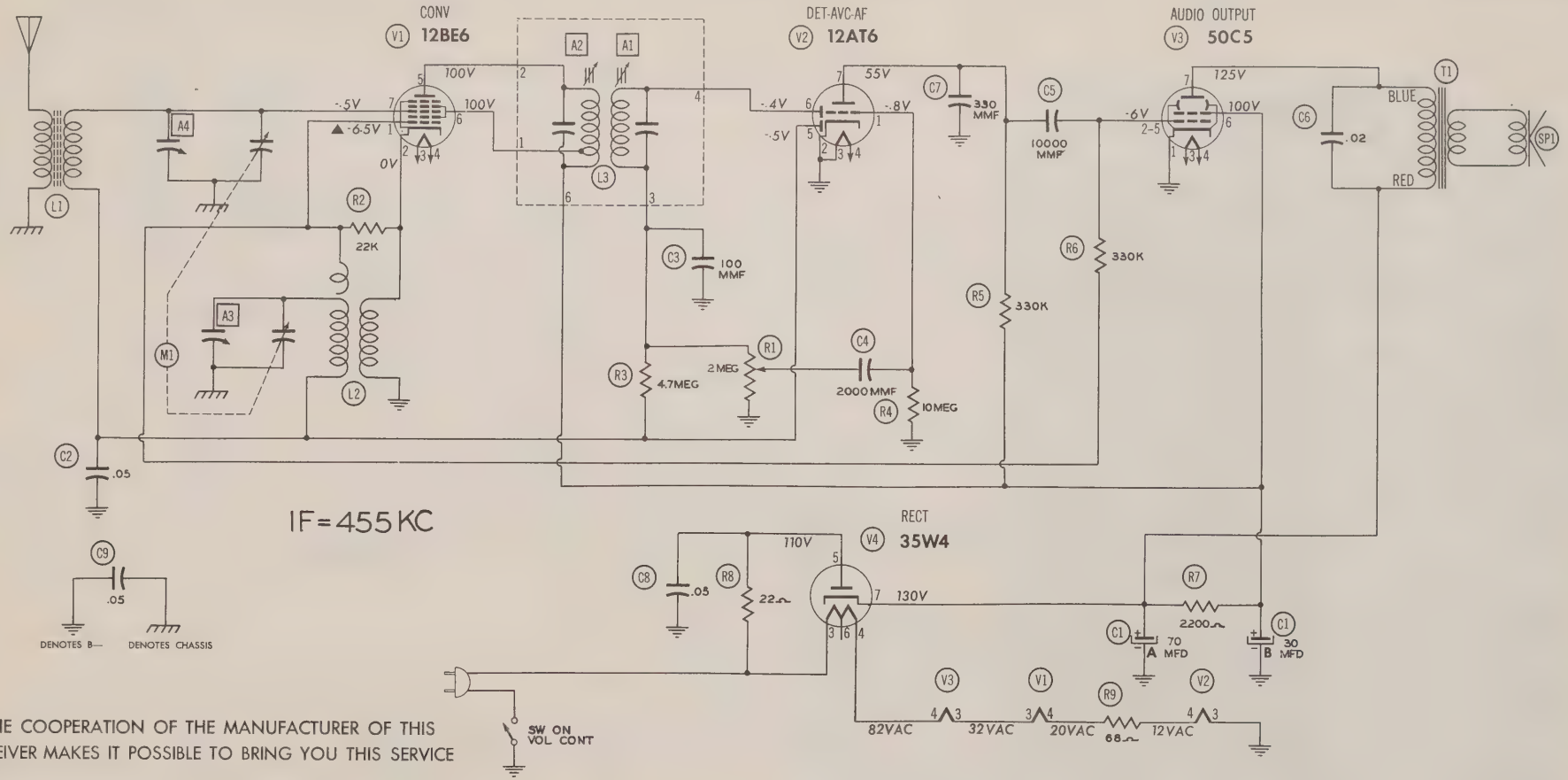
ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M1	Tuning Cap.	160-104	2 gang (34-457MMF, 29-200MMF)
	Cabinet	210-103WH	White Model D2387
	Cabinet	210-103E	Ebony Model D2386
	Cabinet	210-103R	Red Model D2388
	Knob	220-104E	Ebony
	Knob	220-104R	Red
	Knob	220-104WH	White
	Face	206-101G	Gold Foil
	Face	206-101B	Blue Foil
	Face	206-101GR	Green Foil
	Face	206-101R	Red Foil

CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. D. ANKENSHIP
3924 ELOISE ST.
DENVER, COLORADO

TRUETONE MODEL D2386



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	4Ω	100Ω	85Ω	† 2.2KΩ	† 2.2KΩ	7Meg
V 2	12AT6	10Meg	0Ω	0Ω	12Ω	7Meg	2Meg	† 330KΩ
V 3	50C5	0Ω	350KΩ	100Ω	170Ω	350KΩ	† 2.2KΩ	† 150Ω
V 4	35W4	0Ω	350KΩ	210Ω	170Ω	230Ω	160Ω	60KΩ

† MEASURED FROM PIN 7 OF V4

PHOTOFACT STANDARD NOTATION SCHEMATIC
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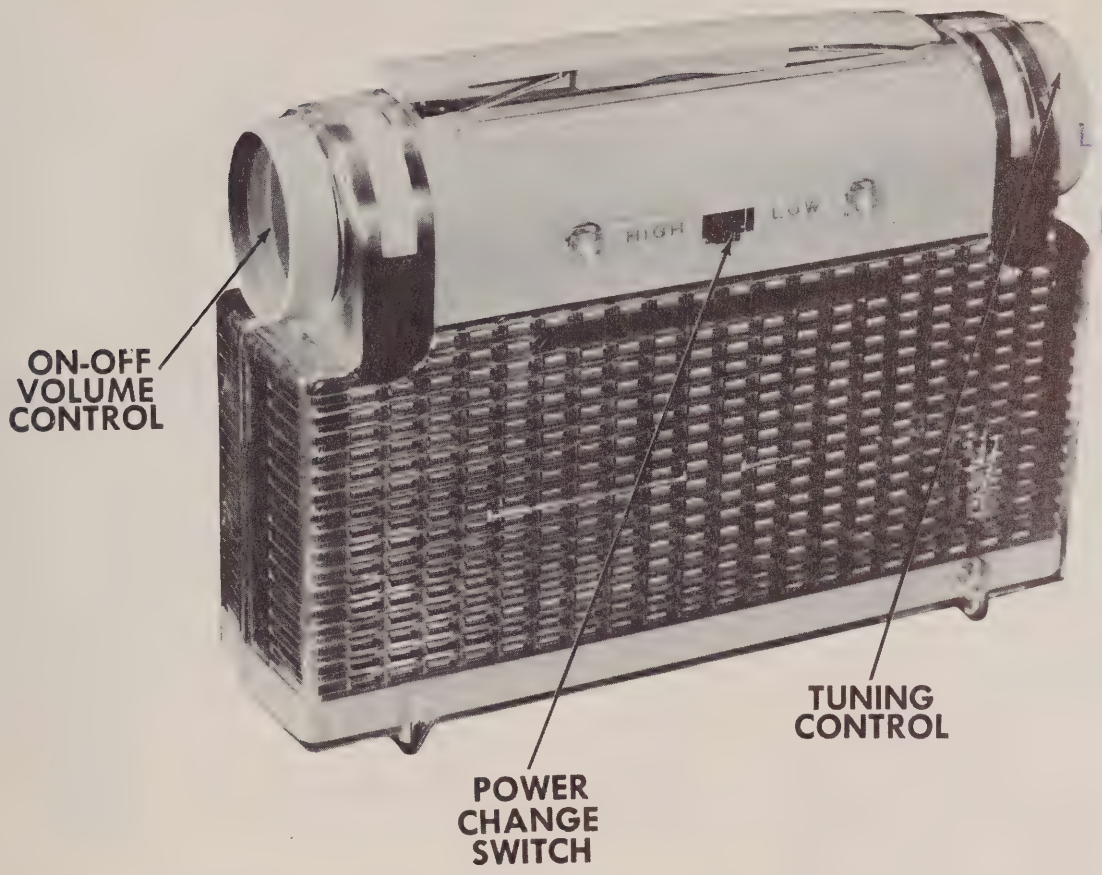
230-13

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ZENITH MODELS
K401 (Ch. 4K40), L401 (Ch. 4L40)



PROPERTY OF
L. F. BLANKENSHIP
3254 WADE ST.
DENVER, COLORADO

ZENITH MODELS
K401 (Ch. 4K40), L401 (Ch. 4L40)

TRADE NAME	Zenith Models K401 (Ch. 4K40), L401 (Ch. 4L40)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.
TYPE SET	Battery Operated AM Superheterodyne Receiver
TUBES (Four)	Types 1U6 (or) 1L6 (or) 1R5 Conv., 1AF4 (or) 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY RATINGS	1.5 Volts "A" Supply & 67.5 Volts "B" Supply 200MA @ 1.5 Volts DC & 11MA @ 67.5 Volts DC (Battery saver switch in "Low" Position)
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1U6 (V1). Low side to chassis.	455KC (400~Mod)	600KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	Tuning gang fully open	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

To set pointer turn tuning gang fully closed and set dial drum so that index mark on cabinet coincides with bottom edge of "55".

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PARTS LIST AND DESCRIPTIONS

ZENITH
MODEL K401 (Ch. 4K40)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	Converter *	1U6	1U6	7CD	* Used in Ch. 4K40 & early versions of Ch. 4L40
B	Converter *	1L6	1L6	7DC	† Used in late versions of Ch. 4L40
C	Converter †	1R5	1R5	7AT	
V2A	IF Amplifier	1AF4	1AF4	6AR	
B	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	8	70	22-2433	PRS150/8		BR815		TC41	TVA-1405	
C2A	10000		22-2276	BPD-2X01	DD3-103	TM5DS1	811-01	DC-511	5HK-2S1	Note 1
B	10000						811-01	DC-511		
C3	100		22-1669	S1100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C4	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C5	100		22-1669	S1100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C6	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C7	100		22-1669	S1100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C8	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C9	4000		22-4	BPD-004	D6-402	TM5D4	GP2-333-402	UC-5240	5HK-D4	
C10	.0022	200	22-2436	P285-0022	D6-222	PJ6D2	GP2-333-222	PT6222	6TM-D22	

Note 1. In later production, C2B is not used & C2A becomes single unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	63-1553	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

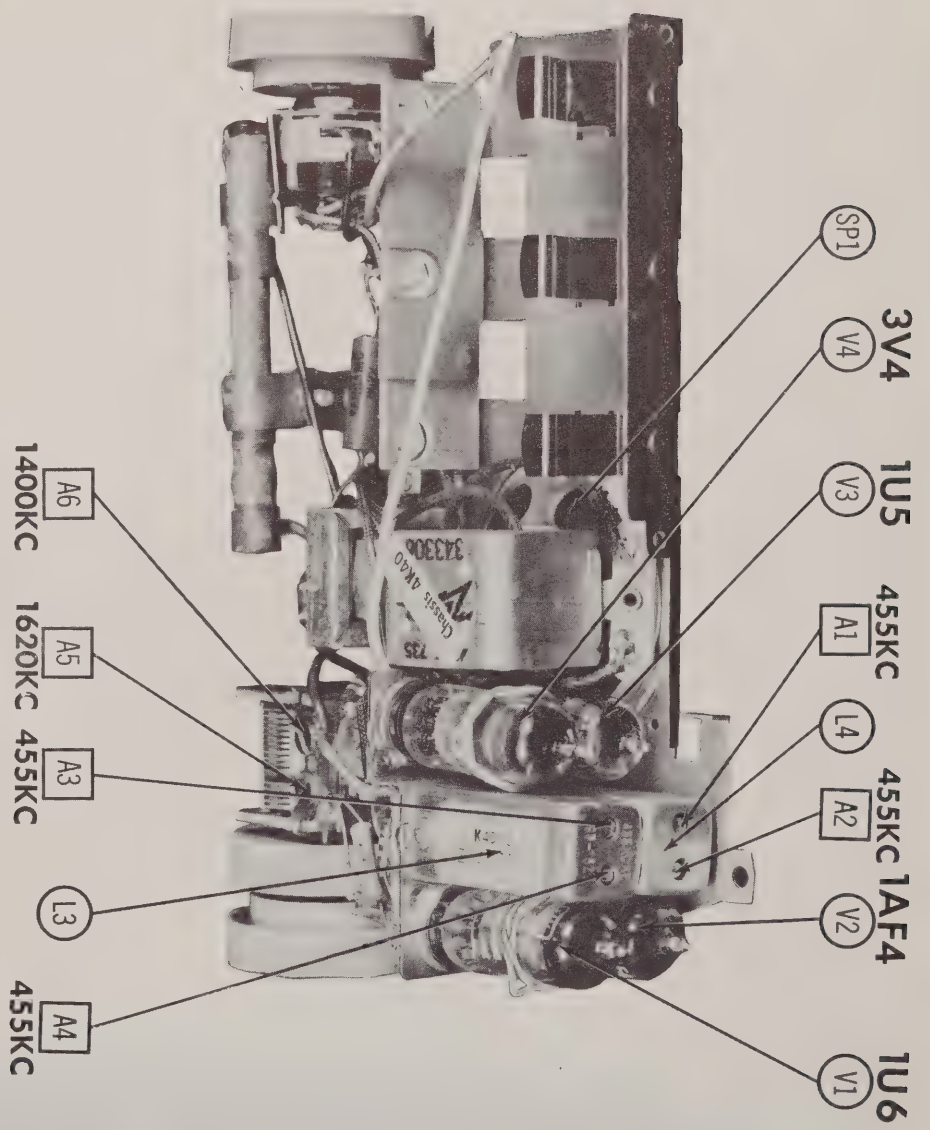
RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R2	180KΩ	½	63-1880	BTS-180K	Note 1
R3	10KΩ	½	63-1828	BTS-10K	Note 2
R4	1000Ω	½	63-1786	BTS-1000	
R5	6.8Meg	½	63-1947	BTS-6.8Meg	
R6	4.7Meg	½	63-1940	BTS-4.7Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R7	4.7Meg	½	63-1940	BTS-4.7Meg	
R8	1Meg	½	63-1912	BTS-1Meg	
R9	3.3Meg	½	63-1933	BTS-3.3Meg	
R10	300Ω	½	63-1762		
R11	300Ω	½	63-1762		

Note 1. Late production Models (Ch. 4L40) use a 100KΩ resistor in this application.
Note 2. Not used in late production Models (Ch. 4L40).

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	9.8KΩ	10Ω	500Ω	1.3Ω	95-1322					

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
SP1	2½"	PM	10Ω	49-735 49-726 ①			① Alternate 2½" speaker

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.4Ω		S-19266				
L2	Osc. Coil	1.8Ω	4.7Ω	S-19264			70-Osc. *	
L3	Input IF	13.5Ω	13.5Ω	95-1320				
L4	Output IF	13.5Ω	13.5Ω	95-1322				

* Disregard tap on secondary winding.

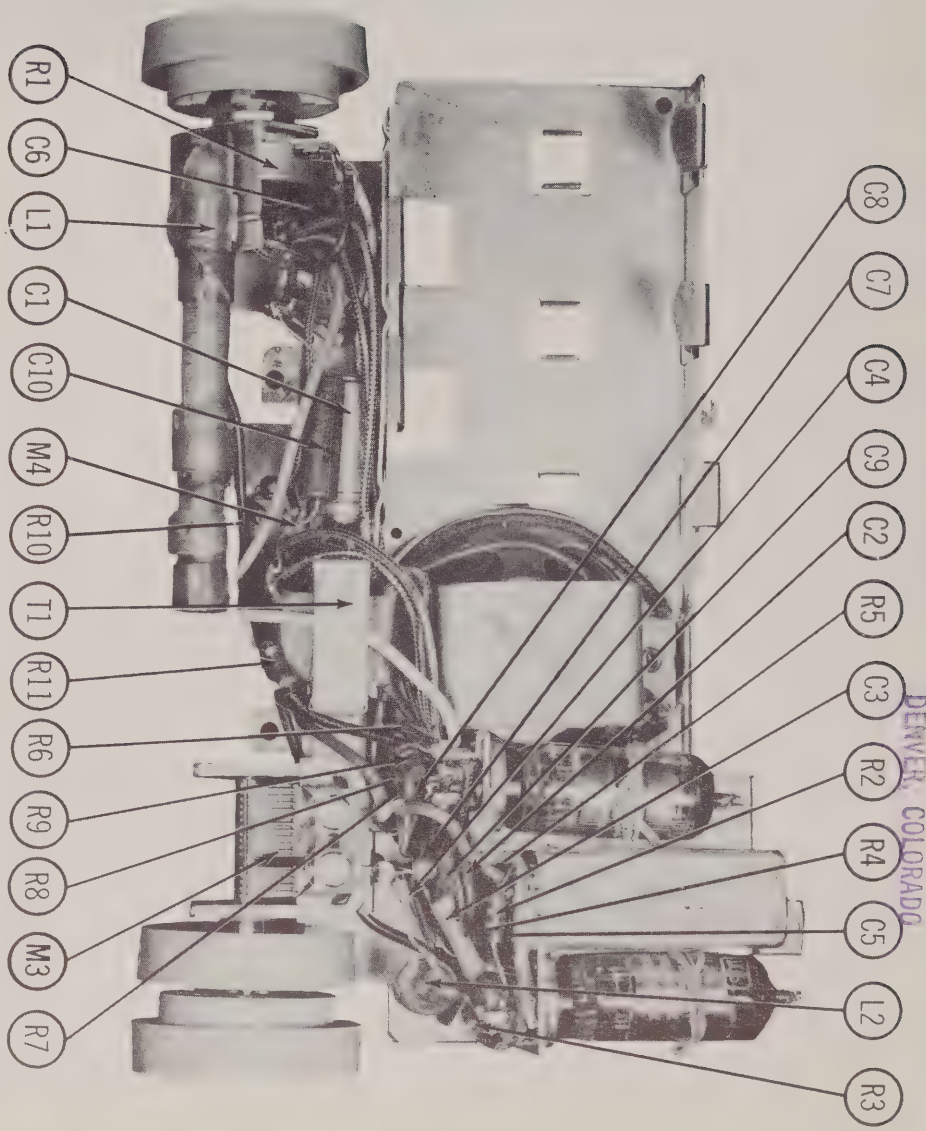
BATTERIES

ITEM No.	VOLTAGE	ZENITH PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1 M2	1½V 67½ V	Battery Kit #4	950	477		2R	P45		3 Used in Parallel

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Tuning Cap.	22-2432	21-270MMF, 10-90MMF
M4	Switch	85-525	Battery Saver (DPST Slide)
	Cabinet Front	S-19273	Models K401G, L401G
	Cabinet Front	S-19445	Models K401R, L401R
	Cabinet Front	S-19588	Model K401W
	Cabinet Front	S-19444	Models K401Y, L401Y
	Cabinet Front	S-19933	Model L401SG
	Cabinet Rear	S-19274	Models K401G, L401G
	Cabinet Rear	S-19449	Models K401R, L401R
	Cabinet Rear	S-19589	Model K401W
	Cabinet Rear	S-19448	Models K401Y, L401Y
	Cabinet Rear	S-19934	Model L401SG
	Dial Scale	26-482	Models K401G, L401G, L401SG
	Dial Scale	26-487	Models K401R, L401R
	Dial Scale	26-490	Model K401W
	Dial Scale	26-486	Models K401Y, L401Y
	Knob	46-1027	Off/on/Volume, Models K401G, L401G, L401SG
	Knob	46-1062	Off/on/volume, Models K401R, L401R
	Knob	46-1094	Off/on/volume, Models K401W
	Knob	46-1061	Off/on/volume, Models K401Y, L401Y
	Knob	46-1028	Tuning, Models K401G, L401G, L401SG
	Knob	46-1066	Tuning, Models K401R, L401R
	Knob	46-1095	Tuning, Model K401W
	Knob	46-1065	Tuning, Models K401Y, L401Y

CHASSIS—BOTTOM VIEW



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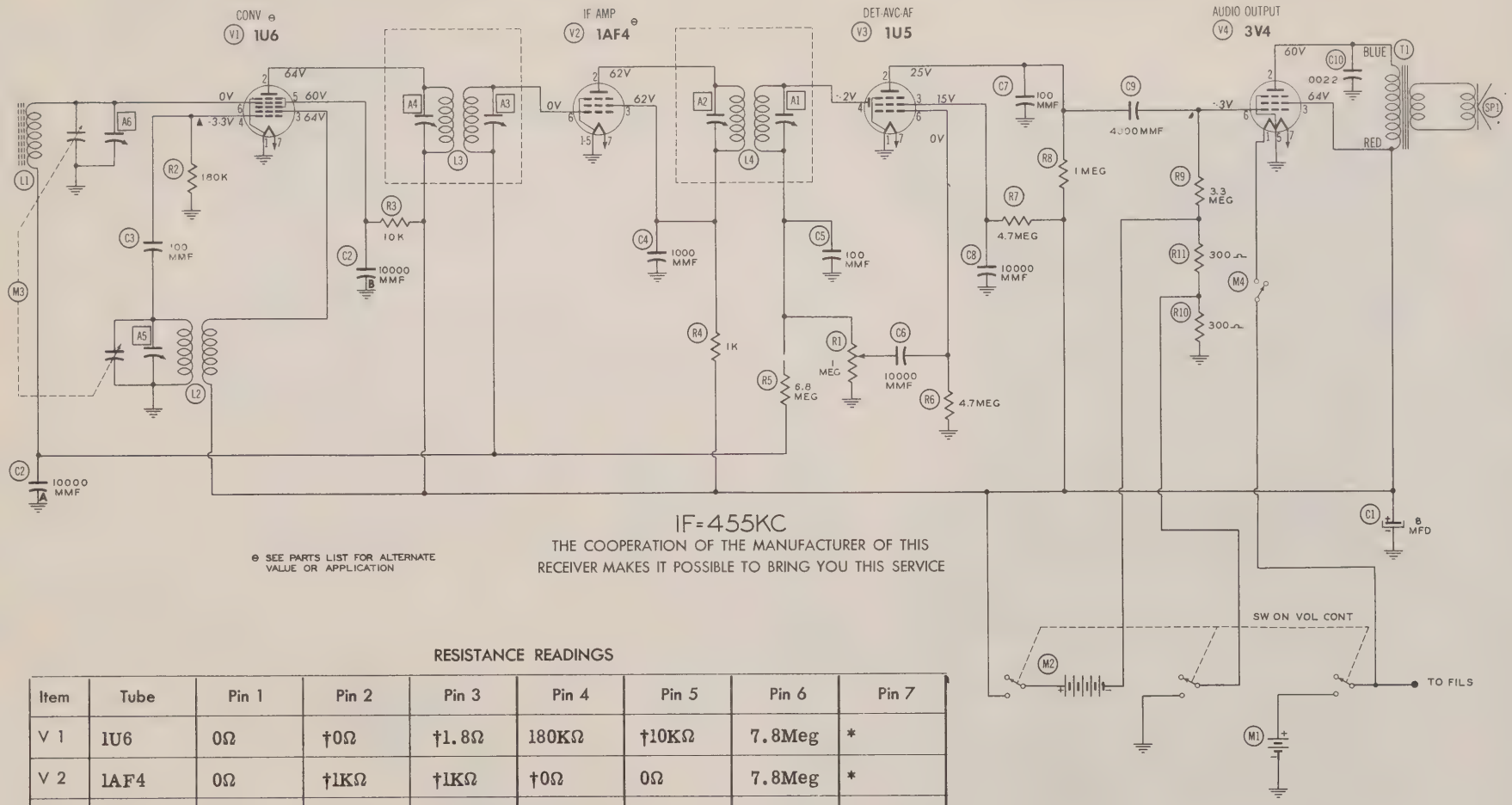
ZENITH
MODEL K401 (Ch. 4K40)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1U6	0Ω	†0Ω	†1.8Ω	180KΩ	†10KΩ	7.8Meg	*
V 2	1AF4	0Ω	†1KΩ	†1KΩ	†0Ω	0Ω	7.8Meg	*
V 3	1U5	0Ω	†1Meg	†4.7Meg	1Meg	†0Ω	4.7Meg	*
V 4	3V4	*	†500Ω	†0Ω	300Ω	0Ω	3.3Meg	*

ALL MEASUREMENTS TAKEN WITH M4 IN "HIGH" POSITION.
▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 3 OF V4 (B+)
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5 - Volume control at maximum, no signal applied for voltage measurements.

PROPERTY OF
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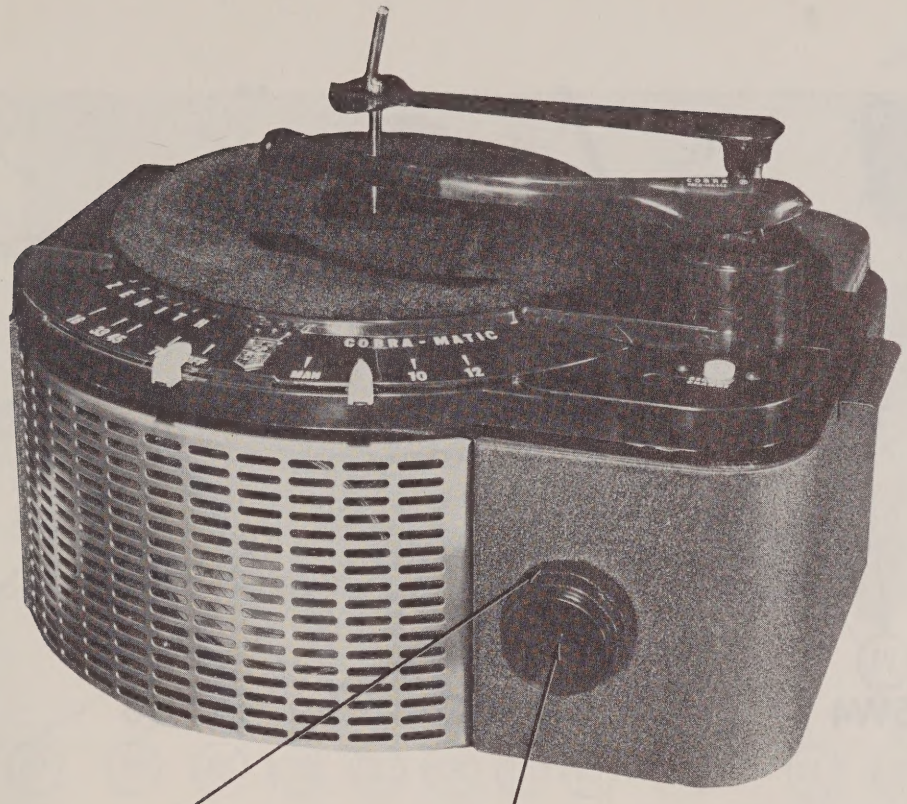
DENVER, COLORADO

ZENITH
MODELS S-9010 (Ch. 4L02)



ZENITH
MODELS S-9010 (Ch. 4L02)

TRADE NAME	Zenith Model S-9010 (Ch. 4L02)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.
TYPE SET	AC Operated Phono Amplifier with Variable Speed Record Changer Unit (Model S-14055)
TUBES (Three)	Types 12J5 Phono Osc., 12AU6 AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .23 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION RECORD CHANGER UNIT - SEE SIMILAR ZENITH MODEL S-14053, PHOTOFACT SET 226, FOLDER 13.

PHONO ADJUSTMENT

If the phono oscillator requires adjustment, turn trimmer, B1, until a reading of approximately 75 millivolts is obtained at the test point designated on the schematic. If the unit should begin to oscillate resulting in a high pitch squeal, adjust B1 until the squeal ceases.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ZENITH PART No.	STANDARD REPLACEMENT		
V1	Phono Pre Amp.	12J5	12J5	6Q	
V2	AF Amplifier	12AU6	12AU6	7BK	
V3	Audio Output	50C5	50C5	7CV	
V4	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	60	150	22-2442	AFH4-37		D029		FP409	R1431	
B	40	150						TC45		
C	20	150								
D	20	25								
C2	100	500	22-2361	1468-0001	D6-101	5W5T1	GP1K-101	MC-235	1FM-31	
C3	.05	200	22-829	P288-05	DF-503	PTE4S5		PT415	2TM-S5	
C4	470		22-6		D6-471		GP2K-471	UC-5347	5GA-T47	
C5	.002	200	22-1710	P285-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C6	.02	200	22-1386	P285-02	DD-203	PTE4S2		PT412	2TM-S2	
C7	.002	200	22-1710	P285-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C8	.05	200	22-829	P285-05	DF-503	PTE4S5		PT415	2TM-S5	
C9	.05	200	22-829	P285-05	DF-503	PTE4S5		PT415	2TM-S5	
C10	110		22-5	S1110	D6-121	TM5T12	GP1K-121	UC-5312	5GA-T12	
C11	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C12	.01	400	22-1182	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C13	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C14	.05	200	22-829	P285-05	DF-503	PTE4S5		PT415	2TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	1/2	63-2863	QJ-498 *				Tone
B	1Meg	1/2						Volume

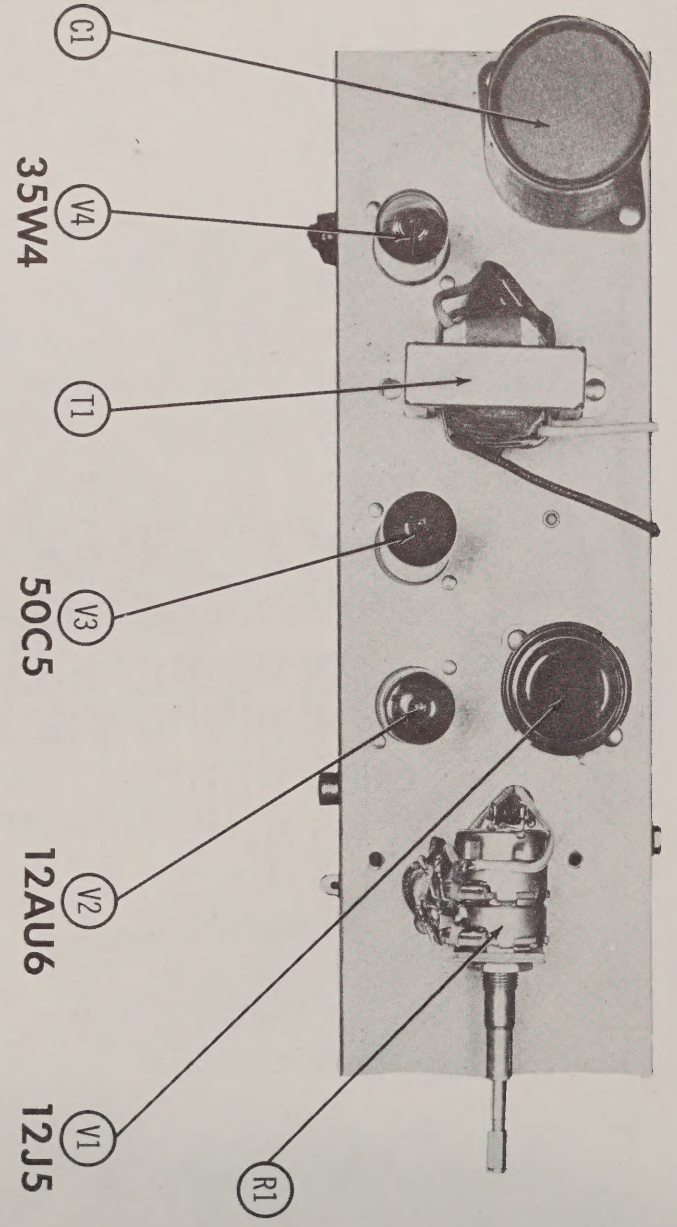
* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B11-137 & P1-109 (Panel) B11-137 & R3-204 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R2	6.8Meg	1/2	63-1947	BTS-6.8Meg	
R3	22KΩ	1/2	63-1842	BTS-22K	
R4	47KΩ	1/2	63-1856	BTS-47K	
R5	2200Ω	1/2	63-1800	BTS-2200	
R6	6800Ω	1/2	63-1821	BTS-6800	
R7	15Meg	1/2	63-1961	BTS-15Meg	
R8	680KΩ	1/2	63-1905	BTS-680K	
R9	220KΩ	1/2	63-1884	BTS-220K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R10	470KΩ	1/2	63-1898	BTS-470K	
R11	150Ω	1/2	63-686	BTS-150	
R12	6800Ω	1/2		BTS-6800	
R13	1500Ω	1/2	63-1792	BTS-1500	
R14	22Ω	1/2	63-1219	BTS-22	
R15	56Ω	2		BTB-56	
R16	33Ω	1	63-1094	BTA-33	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.4KΩ	3.3Ω	19Ω tap @ 20Ω	.6Ω SEC.2 1.2Ω	95-1329					

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3.3Ω	49-716	ST-803 Mod. P525-V	52A1	

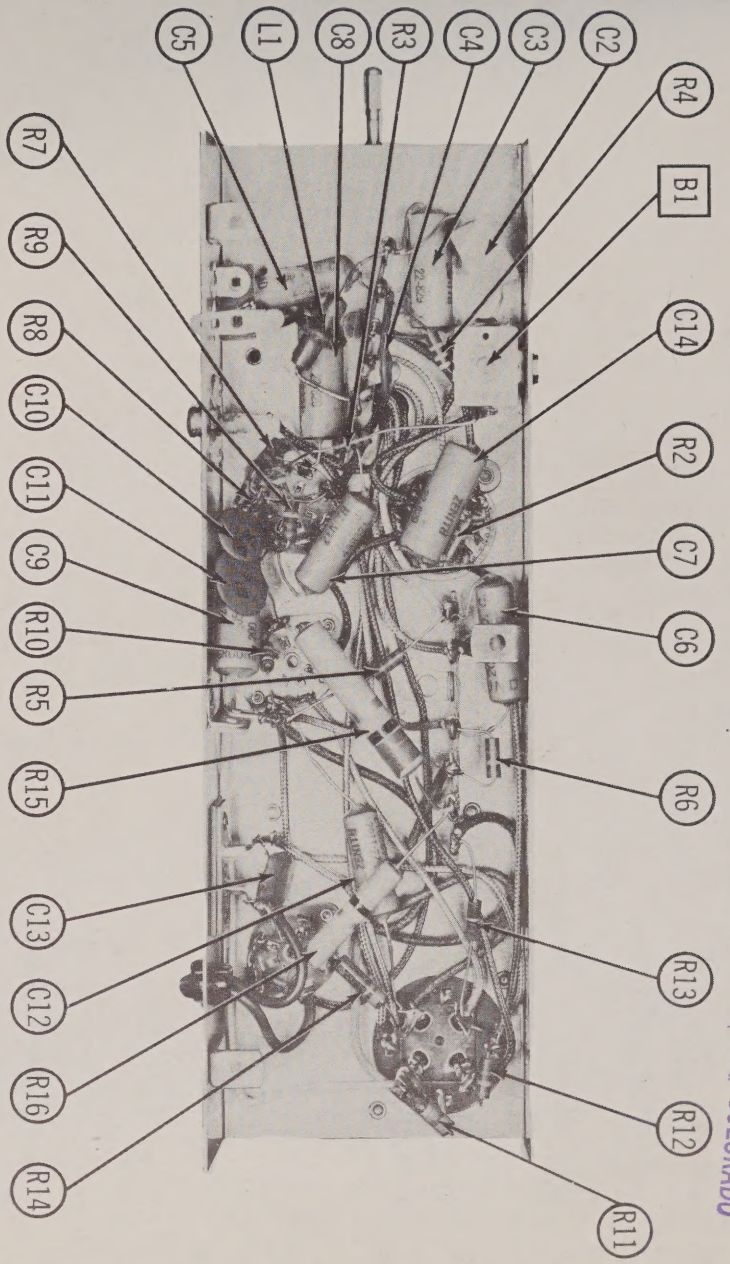
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Phono Osc. Coil	2Ω		S-12603				49 Microhenries

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
B1	Trimmer cap	22-2486	
	Phono Cartridge	S-15780	
	Cabinet	14-1566	Metal
	Knob	46-774	Tone
	Knob	46-775	Off-on volume

CHASSIS—BOTTOM VIEW



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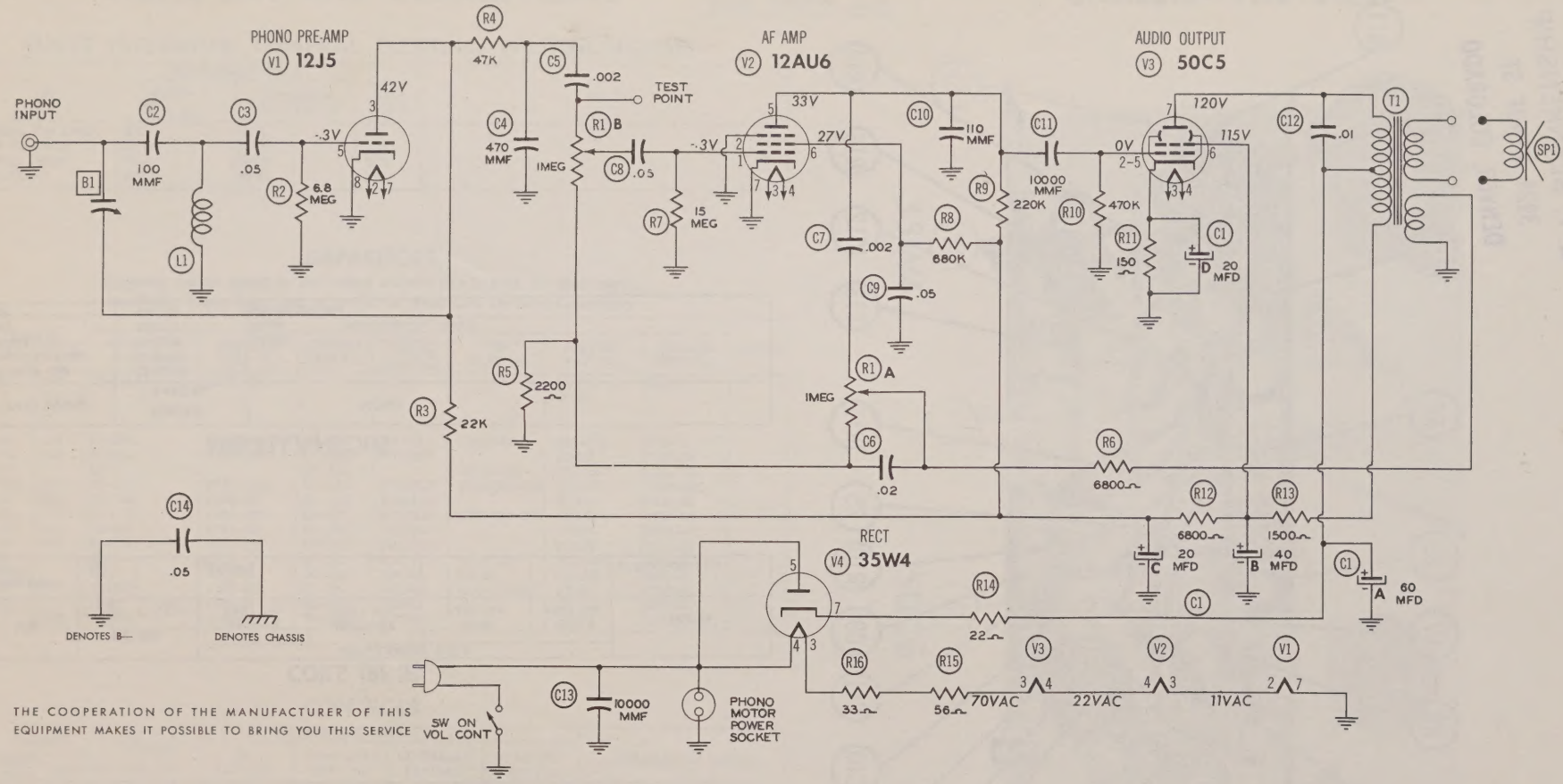
DENVER, COLORADO

ZENITH
MODEL S-9010 (Ch. 41.02)



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12J5	INF	12Ω	† 30.5KΩ	INF	6.8Meg	INF	0Ω	0Ω
V 2	12AU6	15Meg	0Ω	12Ω	23Ω	† 230KΩ	† 690KΩ	0Ω	
V 3	50C5	150Ω	470KΩ	78Ω	23Ω	470KΩ	† 1.5KΩ	† 192Ω	
V 4	35W4	INF	INF	160Ω	200Ω	200Ω	190Ω	40KΩ	

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V4

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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230-15

1 - DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.